



12141 Wickchester Lane
Suite 640
Houston, TX 77079
TEL 713.491.8333
FAX 713.395.5486
www.GarverUSA.com

August 15, 2016

Addendum No.2

**To Plans, Contract Documents and Specifications
IFB 16-022/JW, Taxiway D Reconstruction (2016)**

This addendum shall be a part of the Plans, Contract Documents and Specifications to the same extent as though it were originally included therein, and it shall supersede anything contained in the Plans, Contract Documents and Specifications with which it might conflict. All bidders shall acknowledge receipt of this Addendum on page C-4 of the sealed bid proposal.

Pre-Bid Meeting:

1. A pre-bid meeting was held on August 10, 2016:

- The agenda for the meeting is attached and forms part of the addendum
- The sign-in sheet of attendees to the pre-bid meeting is attached.

Modifications to the Bid Form:

1. Replace the following pages:

- Proposal pages C-5 to C-14 with the attached pages C-5 to C-14. A pay item for lighted runway closure markers was added as item SS-120-2.

Modifications to the Specifications:

1. Replace the following specifications:

- SS-120 'Site Preparation' with the attached specification SS-120 'Site Preparation'. Paragraph 120-2.3 was modified along with adding pay item SS-120-2.
- SS-300 'Basic Electrical Requirements' with the attached specification SS-300 'Basic Electrical Requirements'. Paragraph 300-2.6 and 300-4.1 were added along with pay item SS-300-5.2.
- SS-310 'Airport Lighting Systems' with the attached specification SS-310 'Airport Lighting Systems'. The portions of paragraph 310-3.9 related to in-pavement lighting were struck through since there is no in-pavement lighting work in the project.

Modifications to the Plans:

1. Replace the following sheets:

- G-102 'Sheet Index and Summary of Quantities' with the attached sheet G-102 'Sheet Index and Summary of Quantities'.
- G-303 'Safety and Phasing Plan – Phase 1A' with the attached sheet G-303 'Safety and Phasing Plan – Phase 1A'.

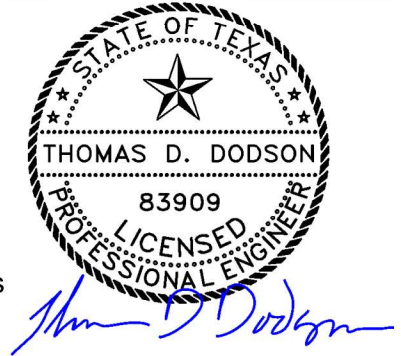
- E-001 'Electrical Legend and Notes' with the attached sheet E-001 'Electrical Legend and Notes'.
- E-201 'Lighting Installation Plan I' with the attached sheet E-201 'Lighting Installation Plan I'.
- E-203 'Lighting Installation Plan III' with the attached sheet E-202 'Lighting Installation Plan III'.

Bidder Questions with Answers:

Questions have been asked at the pre-bid meeting and received by email. The response to these questions is attached to this addendum. Questions are paraphrased and are as understood by Garver.

By: Thomas D Dodson, PE.

Attachments: Bid Form: 10 pages
Pre-bid Meeting Agenda and Sign-in sheet: 3 pages
Revised Plansheets: 5 sheets
Revised Specifications: 32 pages
Response to Bidder Questions: 2 pages



JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BASE BID

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
FAA Section 105	MOBILIZATION	LS	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-120-1	SITE PREPARATION	LS	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-120-2	LIGHTED RUNWAY CLOSURE MARKERS	DAY	10	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
D-701-1	30" STORMWATER PIPE	L.F.	292	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
D-701-2	REMOVAL OF 30" CONCRETE PIPE	L.F.	390	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
D-751-1a	4'X4' SINGLE GRATE INLET (HEAVY-DUTY)	EACH	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
D-752-1	CONNECT 30" RCP TO EXIST. GRATE INLET, COMPLETE IN-PLACE	L.S.	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
P-101-1	CONCRETE PAVEMENT REMOVAL	S.Y.	17,050	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-101-2	MILLING AND REMOVAL OF ASPHALT PAVEMENT SURFACING (8" TO 0" THICKNESS)	S.Y.	2,110	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-152-1	UNCLASSIFIED EXCAVATION	C.Y.	1,100	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-152-2	BORROW EXCAVATION	C.Y.	6,000	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-152-3	UNSUITABLE EXCAVATION	C.Y.	180	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-154-1	8" SUBBASE COURSE	S.Y.	7,390	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-155-1	16" LIME-TREATED SUBGRADE	S.Y.	7,930	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
P-155-2	LIME	TON	300	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-156-1	SEDIMENT CONTROL FENCE	L.F.	2,680	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-156-2	INLET PROTECTION	EACH	3	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-501-1	12.5" PORTLAND CEMENT CONCRETE PAVEMENT	S.Y.	6,840	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-605-1	CONCRETE JOINT CLEAN AND SEAL	L.F.	9,220	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-620-1	RETRO-REFLECTIVE PAVEMENT MARKINGS	S.F.	2,800	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-620-2	PREFORMED RUNWAY HOLD SIGN MARKINGS	S.F.	775	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
P-620-3	NON-REFLECTIVE BLACK OUTLINE	S.F.	4,950	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
P-620-4	PAVEMENT MARKING REMOVAL	L.S.	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
T-901-1	SEEDING, INCLUDING FERTILIZING AND WATERING	ACRE	7.1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
T-904-1	SODDING	SY	970	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
T-905-1	TOPSOILING (OBTAINED ON SITE OR REMOVED FROM STOCKPILE 2" THICKNESS)	SY	34,000	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-300-5.1	LOCKOUT/TAGOUT AND CONSTANT CURRENT REGULATOR CALIBRATION PROCEDURES	LS	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
SS-301-5.1	EXISTING AIRPORT ROTATING BEACON, REMOVED	EACH	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.2	EXISTING CONCRETE ENCASED, ELECTRICAL JUNCTION STRUCTURE, REMOVED	EACH	2	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.3	EXISTING STAKE MOUNTED EDGE LIGHT, REMOVED	EACH	61	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.4	EXISTING BASE MOUNTED EDGE LIGHT, REMOVED	EACH	7	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.5	EXISTING BASE MOUNTED EDGE LIGHT, REMOVED, BASE TO REMAIN	EACH	12	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.6	EXISTING IN-PAVEMENT EDGE LIGHT, REMOVED	EACH	2	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-301-5.7	ABANDONED SIGN BASE, REMOVED	EACH	4	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
SS-301-5.8	EXISTING BASE MOUNTED EDGE LIGHT, REMOVED	EA	16	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.1	L-858(L) BASE MOUNTED, 1-MODULE GUIDANCE SIGN, INSTALLED	EACH	2	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.2	L-862 BASE MOUNTED RUNWAY EDGE LIGHT, INSTALLED	EACH	2	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.3	L-861T(L) BASE MOUNTED TAXIWAY EDGE LIGHT, INSTALLED	EACH	39	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.4	L-861T(L) BASE MOUNTED TAXIWAY EDGE LIGHT, INSTALLED ON EXISTING BASE	EACH	12	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.5	FIELD LIGHTNING ARRESTOR, INSTALLED	EACH	4	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
SS-310-5.6	TEMPORARY AIRFIELD LIGHTING	L.S.	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
L-101-5.1	L-802A, AIRPORT ROTATING BEACON, IN PLACE	EACH	1	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
L-108-5.1	TRENCHING FOR DIRECT-BURIED CABLE, 18 INCH MINIMUM DEPTH	L.F.	20	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
L-108-5.2	NO. 8 AWG, 5 kV, L-824, TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	L.F.	6,900	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
L-108-5.3	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS AND GROUND CONNECTORS	L.F.	5,200	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
L-108-5.4	TRENCHING FOR DIRECT-BURIED BARE COUNTERPOISE WIRE, 8" MINIMUM DEPTH	L.F.	5,100	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				
L-110-5.1	NON-ENCASED ELECTRICAL CONDUIT, 1W-2"C	L.F.	5,100	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

JACK BROOKS REGIONAL AIRPORT
TAXIWAY D RECONSTRUCTION (2016)
BID FORM

BID ITEM	DESCRIPTION	UNITS	ESTIMATED QUANTITY	UNIT PRICE	BID AMOUNT
L-110-5.2	ENCASED ELECTRICAL CONDUIT, 1W-2"C, WITH FLOWABLE FILL AND SAWCUT PAVEMENT REPAIR	L.F.	140	\$ _____	\$ _____
	Unit price in words: _____ dollars and _____ /100				

TOTAL (BASE BID) \$ _____

Total price in words: _____ dollars and _____ /100

It is understood the quantities of work to be done at unit prices are approximate and are intended for bidding purposes only. Amounts are to be shown in both words and figures. In case of discrepancy the amount shown in words shall govern.

Contract Award will be based on the lowest qualified bidder, depending on the availability of funds.

Bidders understand the Owner reserves the right to reject any irregular proposal and the right to waive technicalities if such waiver is in the best interest of the Owner and conforms to State and local laws and ordinances pertaining to the letting of construction contracts. Funding availability will be considered in selecting the bid award. The bidder agrees this bid shall be honored and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving bids.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" and to fully complete the project within:

- **210 Calendar Days** thereafter.

Bidder further agrees to pay as liquidated damages the sum of **One Thousand Dollars (\$1,000.00)** for each calendar day to complete the work beyond the allotted time or as extended by an approved Change Order or Supplemental Agreement.

The undersigned certifies that the bid prices contained in this bid have been carefully reviewed and are submitted as correct and final. Bidder further certifies and agrees to furnish any and/or all commodities upon which prices are extended at the price offered, and upon the conditions contained in the specifications and the Notice to Bidders.

STATE OF _____ COUNTY OF _____

BEFORE ME, the undersigned authority, a Notary Public in and for the State of _____,

on this day personally appeared _____, who
(name)

after being by me duly sworn, did depose and say:

"I, _____ am a duly authorized officer of/agent
(name)

for _____ and have been duly authorized to execute the
(name of firm)

foregoing on behalf of the said _____.
(name of firm)

I hereby certify that the foregoing bid has not been prepared in collusion with any other bidder or other person or persons engaged in the same line of business prior to the official opening of this bid. Further, I certify that the bidder is not now, nor has been for the past six (6) months, directly or indirectly concerned in any pool or agreement or combination, to control the price of services/commodities bid on, or to influence any person or persons to bid or not to bid thereon."

Name and address of bidder: _____

Fax: _____ Telephone No. _____

by: _____ Title: _____
(print name)

Signature: _____

SUBSCRIBED AND SWORN to before me by the above-named

_____ on

this the _____ day of _____, 2016.

Notary Public in and for
the State of _____

Bidder Shall Return Completed Form with Offer.



12141 Wickchester Lane
Suite 640
Houston, TX 77079
TEL 713.491.8333
FAX 713.395.5486
www.GarverUSA.com

Jack Brooks Regional Airport – Taxiway D Reconstruction (2016) Taxiway ‘H’ to ‘F’ Pre-Bid Meeting

11:00 a.m. August 10, 2016

1) Introductions & Roles:

- a) Alex Rupp, Airport Manager, Jack Brooks Regional Airport (Owner)
- b) Duke Youmans, Operations Manager, Jack Brooks Regional Airport
- c) Megan Landry, Finance Manager, Jack Brooks Regional Airport
- d) Jamey West, Assistant Purchasing Agent, Jefferson County
- e) Tom Dodson, PE, Senior Project Manager, Garver

2) Bidding Procedures

- a) Bids proposals are due no later than 11:00 am local time on August 23, 2016 at the Jefferson County Purchasing Division, 1149 Pearl Street, 1st Floor, Beaumont, Texas 77701. After the cut-off time, bids will be publicly opened and read. DO NOT DELIVER BID PACKAGES TO THE AIRPORT – THEY WILL BE CONSIDERED NON-RESPONSIVE.
- b) Instructions to Bidders. Requirements are detailed in this section.
 - i) Bid package consisting of an entire project manual and 3 copies of the required documents
 - ii) Vendor registration with System for Award Management
- c) Awarded Vendor requirement for Submission of Form 1295
- d) Bids may be held up to 90 days for FAA funding schedule.
- e) Bid Proposal. Contract Time:
 - i) 210 Calendar Days; this is inclusive of typical weather days and holidays.
 - ii) \$1,000 per day Liquidated Damages thereafter.
 - iii) Section K identifies included typical weather days per month.
- f) Contract Award

Base Bid – Taxiway D Reconstruction (2016)
--

3) Federal Provisions

- a) The DBE goal is **12.62%**.
 - i) Questions regarding goals and good faith efforts should be directed to Megan Landry at the airport.

4) FAA General Provisions

- a) 7/21/2014 version of the provisions are included in the project manual portion of the bid documents.
- b) Section 110 covers the calculation of “Percent Within Limits” for concrete pavement pay factors.

5) Plans and Technical Specifications

- a) Plansheets G-301 to G-304 for phasing plan and requirements. This project will only close Runway 12/30 during overnight hours and to non-commercial traffic during a 10-day period at the beginning of construction. Remaining project work will be done with the runway open to all traffic.
- b) Safety Plan Compliance Document SS-101 – this is a document requirement for working on the airfield.
- c) Concrete Pavement P-501 – this specification has been modified to allow side-form construction
- d) Subbase Course P-154 – for foundation beneath the concrete pavement
- e) Lime-Treated Subgrade – for foundation beneath the subbase course. A 6% dosage rate; 16” depth is anticipated to be windrowed in 2 lifts
- f) Airport Lighting Systems SS-310 – for LED taxiway lighting fixtures
- g) Airport Rotating Beacon L-101 – to replace existing beacon fixture

6) Construction Security

- a) Security background checks and driver training. These are to be provided by the Contractor at his own expense for employees that will be driving on the airfield.

7) General Discussion / Question and Answer



Sign In Sheet

<u>Name</u>	<u>Business</u>	<u>Email</u>	<u>Phone</u>
Meghan Leuchey	JBRA	MURPHY@CO.JEFFERSON.CO.US	719-4900
DUKE YOUNG	GBRA	DYOUNG@CO.JEFFERSON.TX.US	719-4900
JAMES WEST	JEFFCO PURCHASING	jwest@co.jefferson.tx.us	409-835-8693
Brian Howard	Auco, LLC	bharrison@alco.com	409-860-4459
KEVIN LOWRANCE	MARTIN MARRETTA	Kevin.Lowrance@martinmarretta.com	409-679-8893
Bill Kelley	MARTIN MARRETTA	William.Kelley@martinmarretta.com	409-658-7791
Donald Stanton	Trinity Trans con	dstanton@trinitytrans.com	940-613-1792
Dylan LeBlanc	MK CONSTRUCTORS	SALES@MKCONSTRUCTORS.COM	409-769-0089
Alex Rupp	JBRA		409-719-4900
Asaen Hatcher	JBRA		409-454-1604
Clarence Huckaby	FAA	Clarence.Huckaby@FAA.gov	409-720-5160
JAMES L. TERRILL, JR	FAA	JAMES.TERRILL@FAA.GOV.	409-720-5160



REGISTRATION NO. F-5713



DIGITALLY SIGNED 08/15/2016

BY: TDD TDD

DESCRIPTION: ADDENDUM # 1, ADDENDUM # 2

DATE: 8/8/16, 8/15/16

REV: 1, 2

JACK BROOKS REGIONAL AIRPORT
JEFFERSON COUNTY, TX
TAXIWAY D RECONSTRUCTION (2016)

SHEET INDEX AND SUMMARY OF QUANTITIES

JOB NO.: 16121501
DATE: JULY, 2016
DESIGNED BY: TDD
DRAWN BY: JS

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER

G-102

SHEET NUMBER **2**

Sheet List Table		
Sheet Number	Drawing Number	Sheet Title
GENERAL		
1	G-101	COVER SHEET
2	G-102	SHEET INDEX AND SUMMARY OF QUANTITIES
3	G-103	GENERAL NOTES
4	G-201	PROJECT LAYOUT AND SURVEY CONTROL PLAN
5	G-301	SAFETY AND PHASING PLAN
6	G-302	SAFETY AND PHASING DETAILS
7	G-303	SAFETY AND PHASING - PHASE IA
8	G-304	SAFETY AND PHASING - PHASE IB
9	G-401	GEOTECHNICAL INVESTIGATION PLAN
CIVIL		
10	C-101	TYPICAL SECTIONS
11	C-201	SWPPP DETAILS I
12	C-202	SWPPP DETAILS II
13	C-203	SWPPP NOTES
14	C-204	SWPPP LAYOUT
15	C-301	EXISTING CONDITIONS LAYOUT I
16	C-302	EXISTING CONDITIONS LAYOUT II
17	C-401	DEMOLITION DETAILS
18	C-402	DEMOLITION LAYOUT
19	C-501	GRADING AND DRAINAGE DETAILS I
20	C-502	GRADING AND DRAINAGE DETAILS II
21	C-503	IL-H-G HORIZONTAL INLET TYPE H 1 OF 2
22	C-504	IL-H-G HORIZONTAL INLET TYPE H 2 OF 2
23	C-505	GRADING AND DRAINAGE PLAN
24	C-601	STORM DRAIN PROFILE
25	C-701	GEOMETRIC PLAN I
26	C-702	GEOMETRIC PLAN II
27	C-801	PAVEMENT PROFILES
28	C-901	JOINTING DETAILS I
29	C-902	JOINTING DETAILS II
30	C-903	JOINT LAYOUT PLAN I
31	C-904	JOINT LAYOUT PLAN II
32	C-1001	JOINT ELEVATIONS LAYOUT I
33	C-1002	JOINT ELEVATIONS LAYOUT II
MARKINGS		
34	M-101	MARKING DETAILS
35	M-102	MARKING REMOVAL PLAN
36	M-103	MARKING AND SIGNAGE LAYOUT I
37	M-104	MARKING AND SIGNAGE LAYOUT II
CROSS SECTIONS		
38	XS-101	TAXIWAY D CROSS SECTIONS I
39	XS-102	TAXIWAY D CROSS SECTIONS II
40	XS-103	TAXIWAY D CROSS SECTIONS III
41	XS-104	TAXIWAY D CROSS SECTIONS IV
42	XS-105	TAXIWAY D CROSS SECTIONS V
43	XS-106	TAXIWAY D CROSS SECTIONS VI
44	XS-107	TAXIWAY D CROSS SECTIONS VII
45	XS-108	TAXIWAY D CROSS SECTIONS VIII
46	XS-109	TAXIWAY D CROSS SECTIONS IX
47	XS-110	TAXIWAY H (DEMO) CROSS SECTIONS I
48	XS-111	TAXIWAY H (DEMO) CROSS SECTIONS II
49	XS-112	TAXIWAY G (DEMO) CROSS SECTIONS I
50	XS-113	TAXIWAY G (DEMO) CROSS SECTIONS II
ELECTRICAL		
51	E-001	ELECTRICAL LEGEND AND NOTES
52	E-101	LIGHTING REMOVAL PLAN I
53	E-102	LIGHTING REMOVAL PLAN II
54	E-201	LIGHTING INSTALLATION PLAN I
55	E-202	LIGHTING INSTALLATION PLAN II
56	E-203	LIGHTING INSTALLATION PLAN III
57	E-301	ELECTRICAL DETAILS I
58	E-302	ELECTRICAL DETAILS II
59	E-303	ELECTRICAL DETAILS III
60	E-304	ELECTRICAL DETAILS IV
61	E-305	ELECTRICAL DETAILS V
62	E-306	ELECTRICAL DETAILS VI

SS-301-5.2	EXISTING CONCRETE ENCASED, ELECTRICAL JUNCTION STRUCTURE, REMOVED	EACH	2
SS-301-5.3	EXISTING STAKE MOUNTED EDGE LIGHT, REMOVED	EACH	61
SS-301-5.4	EXISTING BASE MOUNTED EDGE LIGHT, REMOVED	EACH	7
SS-301-5.5	EXISTING BASE MOUNTED EDGE LIGHT, REMOVED, BASE TO REMAIN	EACH	12
SS-301-5.6	EXISTING IN-PAVEMENT EDGE LIGHT, REMOVED	EACH	2
SS-301-5.7	ABANDONED SIGN BASE, REMOVED	EACH	4
SS-301-5.8	EXISTING BASE MOUNTED GUIDANCE SIGN, REMOVED	EACH	16
SS-310-5.1	L-858(L) BASE MOUNTED, 3-MODULE GUIDANCE SIGN, INSTALLED	EACH	2
SS-310-5.2	L-862 BASE MOUNTED RUNWAY EDGE LIGHT, INSTALLED	EACH	2
SS-310-5.3	L-861T(L) BASE MOUNTED TAXIWAY EDGE LIGHT, INSTALLED	EACH	39
SS-310-5.4	L-861T(L) BASE MOUNTED TAXIWAY EDGE LIGHT, INSTALLED ON EXISTING BASE	EACH	12
SS-310-5.5	FIELD LIGHTNING ARRESTOR, INSTALLED	EACH	4
SS-310-5.6	TEMPORARY AIRFIELD LIGHTING	L.S.	1
L-101-5.1	L-802A, AIRPORT ROTATING BEACON, IN PLACE	EACH	1
L-108-5.1	TRENCHING FOR DIRECT-BURIED CABLE, 18 INCH MINIMUM DEPTH	L.F.	20
L-108-5.2	NO. 8 AWG, 5 kV, L-824, TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	L.F.	6,900
L-108-5.3	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS AND GROUND CONNECTORS	L.F.	5,200
L-108-5.4	TRENCHING FOR DIRECT-BURIED BARE COUNTERPOISE WIRE, 8" MINIMUM DEPTH	L.F.	5,100
L-110-5.1	NON-ENCASED ELECTRICAL CONDUIT, 1W-2"C	L.F.	5,100
L-110-5.2	ENCASED ELECTRICAL CONDUIT, 1W-2"C, WITH FLOWABLE FILL AND SAWCUT PAVEMENT REPAIR	L.F.	140

SPEC. NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
Sect 105	MOBILIZATION	L.S.	1
SS-120-1	SITE PREPARATION	L.S.	1
SS-120-2	LIGHTED RUNWAY CLOSURE MARKERS	DAY	10
D-701-1	30" STORMWATER PIPE	L.F.	292
D-701-2	REMOVAL OF 30" CONCRETE PIPE	L.F.	390
D-751-1	4'X4' SINGLE GRATE INLET (HEAVY-DUTY)	EACH	1
D-752-1	CONNECT 30" RCP TO EXIST. GRATE INLET, COMPLETE IN-PLACE	L.S.	1
P-101-1	CONCRETE PAVEMENT REMOVAL	S.Y.	17,050
P-101-2	MILLING AND REMOVAL OF ASPHALT PAVEMENT SURFACING (8" TO 0" THICKNESS)	S.Y.	2,110
P-152-1	UNCLASSIFIED EXCAVATION	C.Y.	1,100
P-152-2	BORROW EXCAVATION	C.Y.	6,000
P-152-3	UNSUITABLE EXCAVATION	C.Y.	180
P-154-1	8" SUBBASE COURSE	S.Y.	7,390
P-155-1	16" LIME-TREATED SUBGRADE	S.Y.	7,930
P-155-2	LIME	TON	300
P-156-1	SEDIMENT CONTROL FENCE	L.F.	2,680
P-156-2	INLET PROTECTION	EACH	3
P-501-1	12.5" PORTLAND CEMENT CONCRETE PAVEMENT	S.Y.	6,840
P-605-1	CONCRETE JOINT CLEAN AND SEAL	L.F.	9,220
P-620-1	RETRO-REFLECTIVE PAVEMENT MARKINGS	S.F.	2,800
P-620-2	PREFORMED RUNWAY HOLD SIGN MARKINGS	S.F.	775
P-620-3	NON-REFLECTIVE BLACK OUTLINE	S.F.	4,950
P-620-4	PAVEMENT MARKING REMOVAL	L.S.	1
T-901-1	SEEDING, INCLUDING FERTILIZING AND WATERING	ACRE	7.1
T-904-1	SODDING	S.Y.	970
T-905-1	TOPSOILING (OBTAINED ON SITE OR REMOVED FROM STOCKPILE; 2" THICKNESS)	S.Y.	34,000
SS-300-5.1	LOCKOUT/TAGOUT AND CONSTANT CURRENT REGULATOR CALIBRATION PROCEDURES	L.S.	1
SS-300-5.2	BEACON BATTERY BACKUP SYSTEM	L.S.	1
SS-301-5.1	EXISTING AIRPORT ROTATING BEACON, REMOVED	EACH	1

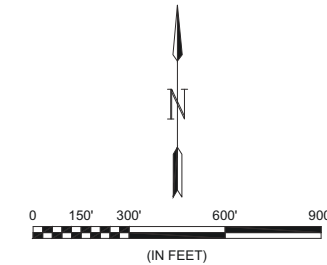
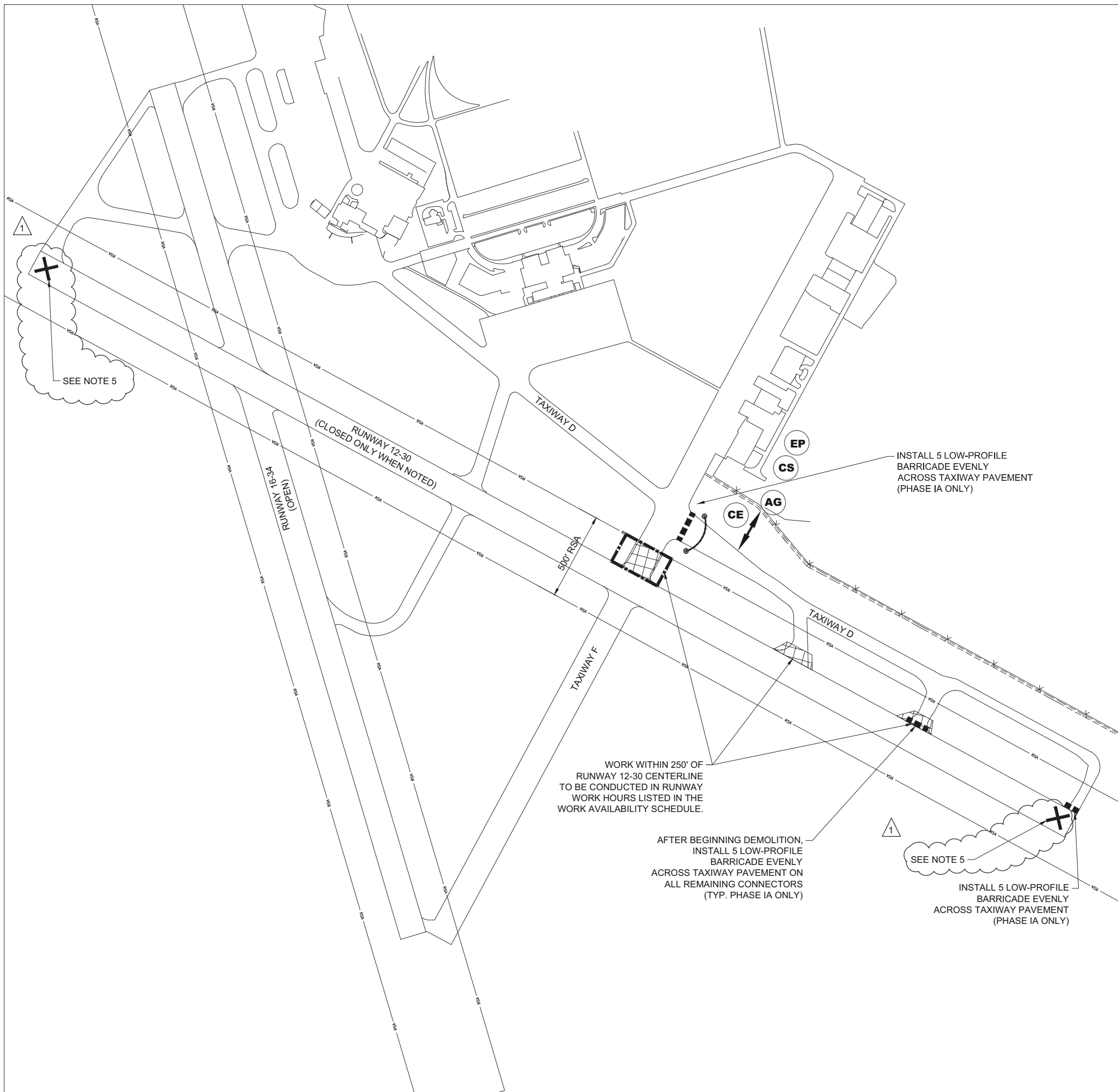
File: I:\2016\16121501 - bpt bw d phase 3 ft & bidding\Drawings\BPT_TMD_G102_S1.dwg Last Save: 8/15/2016 4:14 PM Last saved by: JSuarez
Last plotted by: Suarez, Javier Plot Style: Garver Standard Half.ctb Plot Scale: 1:2 Plot Date: 8/15/2016 4:45 PM Plotter used: VgVyd102;Canon IR C4080 PS

2

2

1

File: I:\2016\16121501 - bpt hw 4 phase 3 ft & bidding\Drawings\BPT_TWD_G303_SP.dwg, Last Saved: 8/15/2016 4:23 PM, Last saved by: JSuarez
 Last plotted by: Suarez, Javier, Plot Style: Garver Standard Halftone, Plot Date: 8/15/2016 4:46 PM, Plotter used: \\gfydc02\Canon IR_C4080 FS



PHASE IA NOTES

1. PLACE LOW PROFILE AIRCRAFT BARRICADES AS INDICATED (SEE DETAIL ON SHEET G-302).
2. INSTALL TEMPORARY LIGHTING CIRCUITS TO ISOLATE WORK AREA FROM OPEN PARTS OF THE AIRPORT.
3. OPAQUE COVER ALL SIGNS WITHIN THE CLOSED PORTIONS OF THE AIRPORT AND SIGNS THAT GIVE GUIDANCE TO THE CLOSED PORTIONS OF THE AIRPORT.
4. REMOVE TAXIWAY 'G' AND TAXIWAY 'H' LIGHTING WITHIN RUNWAY 12-30 SAFETY AREA.
5. MILL TAXIWAY 'G' AND TAXIWAY 'H' WITHIN PHASE IA WORK LIMITS, REGRADE MILLED AREA PRIOR TO RETURNING RUNWAY TO SERVICE.
6. REVEGETATE DISTURBED AREAS.
7. JOINT CLEAN AND SEAL TAXIWAY 'F' WITHIN RUNWAY 12-30 SAFETY AREA AND REMOVE AND REPLACE EXISTING TAXIWAY LIGHTING.

LEGEND

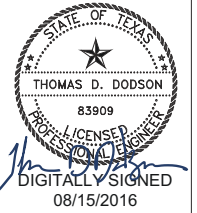
- PHASE IA CONSTRUCTION AREA
- CONTRACTORS ACCESS/HAUL ROUTE
- FENCE
- PERIMETER ROAD
- LOW PROFILE AIRCRAFT BARRICADES (SEE SHEET G-302 FOR DETAILS)
- EXISTING DITCH
- ACCESS GATE
- CONTRACTOR'S STAGING
- CONTRACTOR'S EMPLOYEE PARKING
- CONTRACTOR'S ENTRANCE
- ELECTRICAL JUMPER CONNECTION
- LIGHTED RUNWAY CLOSURE MARKER

GENERAL NOTES:

1. ALL EQUIPMENT AND PERSONNEL MUST REMAIN OUT OF THE RUNWAY SAFETY AREA WHILE THE RUNWAY IS ACTIVE.
2. SEE SHEET G-302 FOR SAFETY AND PHASING DETAILS.
3. FOR THE RUNWAY TO BE RETURNED TO SERVICE, ALL GRADE CHANGES IN EXCESS TO 3 INCHES, MEASURED VERTICALLY, MUST BE REMOVED; THERE MUST BE NO STOCKPILES, EQUIPMENT, MATERIALS OR OBSTRUCTION OVER 3 INCHES IN HEIGHT.
4. AIRPORT OPERATION WILL INSPECT THE AREA PRIOR TO DECLARING THE RUNWAY OPEN. CONTRACTOR IS TO HAVE PERSONNEL AND EQUIPMENT AVAILABLE DURING AND AFTER INSPECTIONS TO CORRECT ANY DEFICIENCIES. ONLY AIRPORT OPERATIONS CAN DECLARE THE RUNWAY OPEN.
5. FOR RUNWAY CLOSURES BETWEEN THE HOURS OF 2200 AND 0600 DAILY, CONTRACTOR WILL BE REQUIRED TO POSITION LIGHTED RUNWAY CLOSURE MARKERS AS SHOWN ON THE PLANS. MARKERS WILL BE REMOVED PRIOR TO RETURNING THE RUNWAY TO SERVICE. A DAY WILL BE MEASURED BY EACH 24 HOUR PERIOD THE MARKER IS IN USE FOR A CLOSURE.



REGISTRATION NO.
F-5713



REV.	DATE	DESCRIPTION	BY
1	8/15/16	ADDENDUM # 2	TDD

JACK BROOKS REGIONAL AIRPORT
JEFFERSON COUNTY, TX

TAXIWAY D RECONSTRUCTION (2016)

SAFETY AND PHASING - PHASE IA

JOB NO.: 16121501
DATE: JULY, 2016
DESIGNED BY: TDD
DRAWN BY: JS

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER
G-303

SHEET NUMBER
7

File: I:\2016\16121501 - bpt bw d phase 3 rd & bidding\Drawings\BPT_TWD_E001_LE.dwg Last Save: 8/15/2016 11:27 AM Last saved by: MCL\leMay
 Last plotted by: leMay, Matthew, C Plot Date: 8/15/2016 4:15 PM Plotter used: \\gfyvdc02\Canon IR C4080 PS

SYMBOL	ITEM DESCRIPTION
	EXISTING EQUIPMENT
	EXISTING EQUIPMENT TO BE COMPLETELY DEMOLISHED AND REMOVED, AREA TO BE RESTORED
	NEW EQUIPMENT
	L-861T TAXIWAY EDGE LIGHT
	L-862 RUNWAY EDGE LIGHT, COLOR AS INDICATED
	L-862E RUNWAY THRESHOLD LIGHT, COLOR AS INDICATED
	L-850C RUNWAY EDGE LIGHT, COLOR AS INDICATED
	BASE MOUNTED LIGHT
	L-867D LIGHT BASE JUNCTION BOX
	L-858 GUIDANCE SIGN, SEE SIGN INDEX
	L-806 WIND CONE
	L-807 WIND CONE WITH SEGMENTED CIRCLE
	L-802A ROTATING BEACON
	ELECTRICAL DUCT, NUMBER AND SIZE OF CONDUITS INDICATED
	DUCT MARKER
	HANDHOLE
	MANHOLE
	3/4" x 10' COPPER CLAD STEEL GROUND ROD
	SERIES LIGHTING CIRCUIT WITH COUNTERPOISE, NUMBER OF HASH MARKS INDICATES NUMBER OF CABLES
SA	SURGE ARRESTOR
T	DRAINABLE AGGREGATE AREA
AFG	ABOVE FINISHED GRADE
AOA	AIRCRAFT OPERATIONS AREA
OFA	OBJECT FREE AREA
OFZ	OBSTACLE FREE ZONE
RSA	RUNWAY SAFETY AREA
TSA	TAXIWAY SAFETY AREA
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
UON	UNLESS OTHERWISE NOTED
DEB	DIRECT EARTH BURIED

ELECTRICAL SAFETY NOTES:

- SERIES CIRCUITS CAN BE DANGEROUS AND / OR FATAL.
- LOCKOUT / TAGOUT PROCEDURES SHALL BE FOLLOWED.
- LIGHTING REGULATORS SHALL BE TURNED OFF, LOCKED, AND TAGGED OUT OF SERVICE BEFORE ANY WORK IS DONE ON THE SERIES CIRCUIT.
- THE ELECTRICAL RESISTANCE AND INSULATION INTEGRITY OF EACH MODIFIED CIRCUIT SHALL BE TESTED BEFORE THE CIRCUIT IS ENERGIZED.

CONSTRUCTION NOTES:

- THE CONTRACTOR SHALL STAKE THE AIRFIELD LIGHTING SYSTEMS, PRIOR TO INSTALLATION OF ANY TRENCH, CABLE, OR LIGHTING APPARATUS. THE INTENT IS TO STAKE THE INSTALLATION AT THE LOCATIONS INDICATED, NOTING ANY DEVIATION FROM PLAN DIMENSIONS TO THE ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL OBTAIN THE SERVICES OF AN EXPERIENCED AND LICENSED SURVEYOR TO PERFORM THIS WORK.
- THE ENGINEER SHALL PROVIDE ELECTRONIC CADD FILES TO THE CONTRACTOR FOR THIS STAKING WORK. THE CONTRACTOR SHALL STAKE THE ITEMS AND HIS SURVEYOR SHALL PROVIDE A CADD FILE SUBMITTAL BACK TO THE ENGINEER. BASED UPON THIS SUBMITTAL, THE ENGINEER SHALL COORDINATE AND PROVIDE DIRECTIONS ON ANY ADJUSTMENTS NECESSARY TO MEET EXISTING FIELD CONDITION REQUIREMENTS AND COMPLY WITH FAA ADVISORY CIRCULAR REQUIREMENTS ON THE LAYOUT AND SPACING OF EQUIPMENT.
- THE CONTRACTOR AND HIS SURVEYOR SHALL THEN MAKE ANY ELECTRONIC CADD FILE SPACING ADJUSTMENTS AND / OR FIELD STAKING ADJUSTMENTS PRIOR TO INSTALLATION AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL VERIFY EXACT PAVEMENT EDGE DIMENSIONS WITH THIS INITIAL SURVEY WORK.
- THE CONTRACTOR SHALL FIELD MARK AND IDENTIFY TAXIWAY POINT OF TANGENCY (PT) AND INTERSECTION POINTS (IP) LOCATIONS WITH EMBEDDED BRASS MARKERS.
- THE EXISTING AND THE PROPOSED LOCATIONS OF LIGHTING CABLES ARE APPROXIMATE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD LOCATING AND IDENTIFYING THE EXISTING LIGHTING CIRCUITS TO DETERMINE THEIR EXACT ROUTING. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING THE LIGHTING SYSTEMS IN A WORKING CONDITION UNTIL THE NEW LIGHTING CIRCUITS HAVE BEEN INSTALLED AND TESTED. THE CONTRACTOR SHALL PROACTIVELY AND EXPEDITIOUSLY ACCOMPLISH THIS CABLE IDENTIFICATION WORK PRIOR TO PERFORMING ANY MODIFICATIONS TO THE LIGHTING CIRCUITS. COORDINATE IDENTIFICATION WORK WITH THE OWNER AND ENGINEER AND MAKE ALL CORRECTIONS, ADDITIONS, ETC. ON THE AS-BUILT DRAWINGS.
- THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHILE EXCAVATING IN THE AREA OF LIGHTING CIRCUITS. ANY CABLE OR CONDUIT / DUCT WHICH IS NICKED OR DAMAGED DURING EXCAVATION SHALL BE PROPERLY AND EXPEDITIOUSLY SPLICED OR THE LENGTH OF CABLE AND CONDUIT / DUCT REPLACED. A SPLICE OR CONDUIT / DUCT MARKER SHALL BE INSTALLED AT ALL SPLICE OR OTHER REPAIR LOCATIONS MORE THAN 2' AWAY FROM A LIGHT, SIGN, HANDHOLE, MANHOLE, OR JUNCTION STRUCTURE. ALL REPAIR AND / OR REPLACEMENT WORK AND MATERIALS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER AND TO THE SATISFACTION OF THE OWNER AND ENGINEER.
- ALL ELECTRICAL CABLES SHALL BE CLEARLY IDENTIFIED, LABELED, AND TAGGED AT ALL POINTS WHERE THEY ARE AVAILABLE FOR CONNECTIONS OR INSPECTION, INCLUDING, BUT NOT LIMITED TO MANHOLES, HANDHOLES, PULL BOXES, JUNCTION BOXES, AND LIGHT BASES.
- THE CONTRACTOR SHALL PERFORM MEGGER TESTS ON EACH EXISTING SERIES CIRCUIT PRIOR TO ANY WORK ON THE ELECTRICAL SYSTEM AND EACH NEW AND EXISTING SERIES CIRCUIT AFTER THE ACCEPTANCE TEST PERIOD. MEGGER TESTING REQUIREMENTS SHALL BE SUBSIDIARY TO AND PAID FOR BY L-108 PAY ITEMS.
- THE CONTRACTOR SHALL COORDINATE WITH THE ON-SITE ENGINEER FOR OWNER AND ENGINEER WITNESS OF ALL MEGGER TESTING. THE CONTRACTOR SHALL SUBMIT HIS INITIAL MEGGER TEST REPORTS TO THE OWNER AND ENGINEER PRIOR TO ANY WORK ON THE ELECTRICAL SYSTEM. THIS REPORT SHALL BE APPROVED AND SIGNED BY THE OWNER AND ENGINEER PRIOR TO THE CONTRACTOR PROCEEDING WITH HIS WORK.
- THE CONTRACTOR SHALL CHECK THE LOAD ON EACH EXISTING REGULATOR PRIOR TO ANY WORK ON THE ELECTRICAL SYSTEM AND ON EACH NEW AND EXISTING REGULATOR AFTER THE ACCEPTANCE TEST PERIOD.
- THE CONTRACTOR SHALL CALIBRATE EACH NEW AND EXISTING REGULATOR FOLLOWING THE PERFORMED WORK.
- LOCKOUT / TAGOUT AND CONSTANT CURRENT REGULATOR CALIBRATION PROCEDURES SHALL BE PAID FOR BY SS-300 PAY ITEMS UNLESS OTHERWISE NOTED.
- CONDUITS AND DUCTS UNDER PAVED AREAS SHALL BE CONCRETE ENCASED.
- CONDUITS AND DUCTS UNDER NON-PAVED AREAS SHALL BE NON-ENCASED, UNLESS OTHERWISE NOTED.
- DURING CONSTRUCTION, PROTECT ALL EQUIPMENT, DUCTS, CONDUITS, CABLES, ETC. THAT ARE TO REMAIN IN PLACE. WHERE EXISTING ITEMS ARE CUT, BROKEN, OR DAMAGED, THE CONTRACTOR SHALL REPLACE OR REPAIR PROACTIVELY AND EXPEDITIOUSLY THE ITEMS WITH THE SAME TYPE OF ORIGINAL MATERIAL AND CONSTRUCTION OR BETTER AT NO ADDITIONAL COST TO THE OWNER AND TO THE SATISFACTION OF THE OWNER AND ENGINEER.

CONDUIT DRAIN NOTES:

- OUTLETS FOR CONDUIT DRAINS ARE TO BE SPACED AT A MAXIMUM 1000 FT. INTERVALS OR AS SHOWN ON THE PLANS. CONDUIT DRAIN LOCATIONS SHALL BE INSTALLED AT THE LOWEST LIGHT BASE ELEVATION IN A GIVEN REGION OF THE CONDUIT RUN, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- WHERE THE CONDUIT DRAIN PIPE OUTLETS INTO A SLOPE OR DITCH, THE OUTLET PIPE END SHALL BE MARKED WITH A DELINEATOR POST, AND HAVE A MESH WIRE ANIMAL AND INSECT GUARD OVER THE PIPE END, WITH A 2'X2' EROSION CONTROL PAD. THE CONDUIT DRAIN SYSTEM SHALL BE DESIGNED TO PREVENT ANIMALS AND INSECTS FROM ENTERING THE ELECTRICAL CONDUIT SYSTEM. CONDUIT DRAIN PIPES SHALL ALWAYS BE INSTALLED SUCH THAT WATER WILL FLOW AWAY FROM ELECTRICAL CONDUIT SYSTEM, WITH A MINIMUM 2 PERCENT SLOPE UNLESS OTHERWISE DIRECTED OR APPROVED BY THE ENGINEER.

CAUTION NOTES:

- UNDERGROUND UTILITIES EXIST WITHIN AND ADJACENT TO THE LIMITS OF CONSTRUCTION. AN ATTEMPT HAS BEEN MADE TO LOCATE THESE UTILITIES ON THE PLANS, HOWEVER, ALL EXISTING UTILITIES MAY NOT BE SHOWN AND THE ACTUAL LOCATIONS OF THE UTILITIES MAY VARY FROM THE LOCATIONS SHOWN. PRIOR TO BEGINNING ANY TYPE OF EXCAVATION, THE CONTRACTOR SHALL CONTACT THE UTILITIES INVOLVED AND MAKE ARRANGEMENTS FOR THE LOCATION OF THE UTILITIES ON THE GROUND. THE CONTRACTOR SHALL MAINTAIN THE UTILITY LOCATION MARKINGS UNTIL THEY ARE NO LONGER NECESSARY.
- TEXAS STATE LAW, THE UNDERGROUND FACILITIES DAMAGE PREVENTION ACT, REQUIRES TWO WORKING DAYS ADVANCE NOTIFICATION THROUGH THE TEXAS ONE-CALL SYSTEM CENTER BEFORE EXCAVATING USING MECHANIZED EQUIPMENT OR EXPLOSIVES (EXCEPT IN THE CASE OF AN EMERGENCY). THE ONE-CALL SYSTEM PHONE NUMBER IS 1-800-245-4545. THE CONTRACTOR IS ADVISED THAT THERE IS A SEVERE PENALTY FOR NOT MAKING THIS CALL. NOT ALL UTILITY COMPANIES ARE MEMBERS OF THE TEXAS ONE-CALL SYSTEM; THEREFORE, THE CONTRACTOR IS ADVISED TO CONTACT ALL NON-MEMBER UTILITIES AS WELL AS THE ONE-CALL SYSTEM.

DEMOLITION KEYED NOTES:

- REMOVE EXISTING STAKE-MOUNTED TAXIWAY EDGE LIGHT. (TYPICAL)
- REMOVE EXISTING BASE MOUNTED TAXIWAY GUIDANCE SIGN. (TYPICAL)
- DEMOLISH EXISTING ABANDONED CONCRETE GUIDANCE SIGN BASE.
- EXISTING GUIDANCE SIGN TO REMAIN. (TYPICAL)
- ABANDON EXISTING DEB SERIES CIRCUIT IN PLACE. (TYPICAL)
- REMOVE AND STORE EXISTING IN-PAVEMENT RUNWAY EDGE LIGHT. DEMOLISH BASE.
- EXISTING TAXIWAY EDGE LIGHT TO REMAIN. (TYPICAL)
- EXISTING RUNWAY EDGE LIGHT TO REMAIN. (TYPICAL)
- REMOVE AND STORE EXISTING IN-PAVEMENT, ELEVATED TAXIWAY EDGE LIGHT. DEMOLISH BASE.
- REMOVE EXISTING AIRFIELD CIRCUIT AND ABANDON EXISTING CONDUIT SYSTEM. (TYPICAL)
- REMOVE EXISTING IN-PAVEMENT, ELEVATED TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER. BASE TO REMAIN. (TYPICAL OF 12)
- REMOVE EXISTING CABLE FROM EXISTING CONDUIT SYSTEM.
- EXISTING AIRFIELD CIRCUIT TO REMAIN. (TYPICAL)
- DEMOLISH EXISTING JUNCTION STRUCTURE.
- EXISTING ELECTRICAL DUCT BANK TO REMAIN. (TYPICAL)
- EXISTING JUNCTION STRUCTURE TO REMAIN.
- REMOVE EXISTING AIRFIELD CIRCUIT AND DEMOLISH ELECTRICAL DUCT BANK IN PLACE.
- REMOVE EXISTING CABLE FROM EXISTING ELECTRICAL DUCT BANK.
- EXISTING FAA CABLE TO REMAIN. FIELD LOCATE PRIOR TO DEMOLITION AND PROTECT DURING CONSTRUCTION.

INSTALLATION KEYED NOTES:

- INSTALL NEW L-861T(L) BASE-MOUNTED TAXIWAY EDGE LIGHT. (TYPICAL)
- INSTALL NEW TRENCH TYPE "A". (TYPICAL)
- INSTALL NEW TRENCH TYPE "B". (TYPICAL)
- INSTALL NEW BASE-MOUNTED L-858(L) GUIDANCE SIGN. SEE SHEET E-304 FOR SIGN INDEX.
- CONNECT NEW 1W-2"C NON-ENCASED CONDUIT TO EXISTING CONDUIT STUB-OUT FOR CONNECTION TO EXISTING TAXIWAY LIGHT.
- CORE DRILL EXISTING LIGHT BASE FOR CONNECTION OF NEW CIRCUIT TO EXISTING CIRCUIT.
- INSTALL NEW TRENCH TYPE "C". (TYPICAL FOR CONDUIT INSTALLED IN EXISTING PAVEMENT)
- REMOVE EXISTING ROTATING BEACON LIGHT. INSTALL A NEW L-802A HIGH INTENSITY ROTATING BEACON AND RECONNECT TO EXISTING CIRCUIT.
- INSTALL NEW L-861T(L) BASE-MOUNTED TAXIWAY EDGE LIGHT ON EXISTING BASE. (TYPICAL OF 12)
- INSTALL NEW AIRFIELD CIRCUIT IN EXISTING CONDUIT.
- INSTALL NEW AIRFIELD CIRCUIT IN EXISTING ELECTRICAL DUCT BANK.
- INSTALL NEW 2 FT WATERTIGHT CONDUIT STUB-OUT FOR CONNECTION OF EXISTING DEB CIRCUIT TO NEW AIRFIELD CIRCUIT. SPLICE EXISTING CONDUCTORS TO NEW CONDUCTORS UTILIZING DEB SPLICE. INSTALL NEW DUCT MARKER AT SPLICE LOCATION.
- INSTALL NEW SURGE ARRESTOR IN LINE WITH THE SERIES CIRCUIT. INSTALL BRASS INPAVEMENT MARKER ON CONCRETE LIGHT BASE ENGRAVED WITH "SA".
- INSTALL DRAINABLE AGGREGATE AREA AT INDICATED EDGE LIGHT. SEE DRAIN NOTE ON SHEET E-301, DETAIL 1, NOTE 4.
- INSTALL NEW L-862 RUNWAY EDGE LIGHT.
- PROVIDE NEW BATTERY BACKUP SYSTEM WITH BATTERIES, INVERTER, AND CONTROL PANEL TO PROVIDE A MINIMUM OF TWELVE (12) HOURS OF RUNTIME FOR THE NEW L-802A BEACON. SYSTEM SHALL BE HOUSED WITHIN A NEMA 3R RATED ENCLOSURE.



REGISTRATION NO. F-5713



DIGITALLY SIGNED 08/15/2016

BY	DESCRIPTION	DATE	REV.
MCL	ADDENDUM # 2	8/15/16	1

JACK BROOKS REGIONAL AIRPORT
 JEFFERSON COUNTY, TX
 TAXIWAY D RECONSTRUCTION (2016)

ELECTRICAL LEGEND AND NOTES

JOB NO.: 16121501
 DATE: JULY, 2016
 DESIGNED BY: MCL
 DRAWN BY: JKS

BAR IS ONE INCH ON ORIGINAL DRAWING
 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER
E-001

SHEET NUMBER
51



REGISTRATION NO. F-5713



DIGITALLY SIGNED 08/15/2016

REV.	DATE	DESCRIPTION	BY
1	8/8/16	ADDENDUM # 1	MCL
2	8/15/16	ADDENDUM # 2	MCL

JACK BROOKS REGIONAL AIRPORT
JEFFERSON COUNTY, TX

TAXIWAY D RECONSTRUCTION (2016)

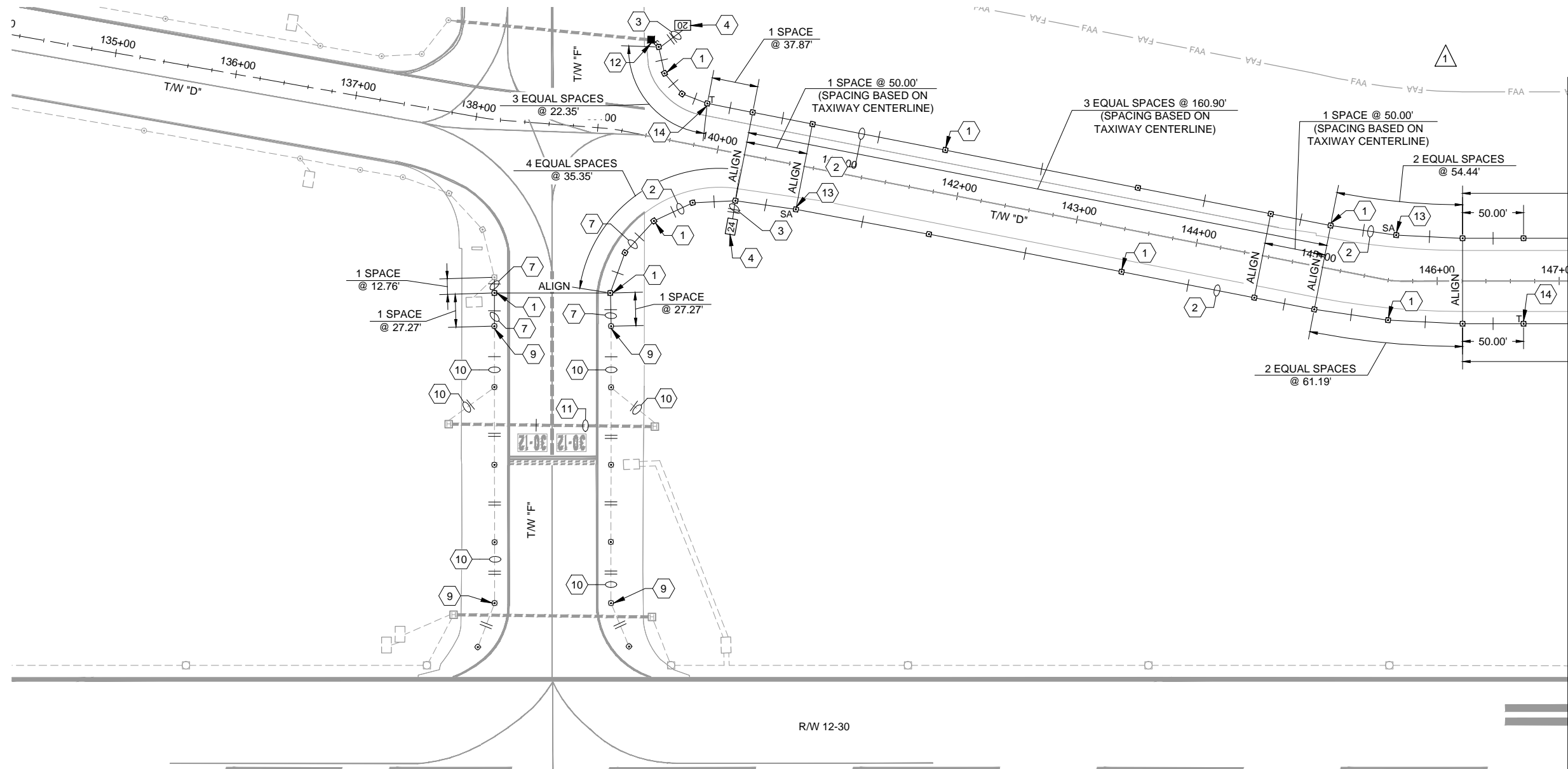
LIGHTING
INSTALLATION PLAN I

JOB NO.: 16121501
DATE: JULY, 2016
DESIGNED BY: MCL
DRAWN BY: JKS

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER
E-201

SHEET NUMBER
54



GENERAL NOTE:

- SEE SHEET E-001 FOR KEYED NOTES.

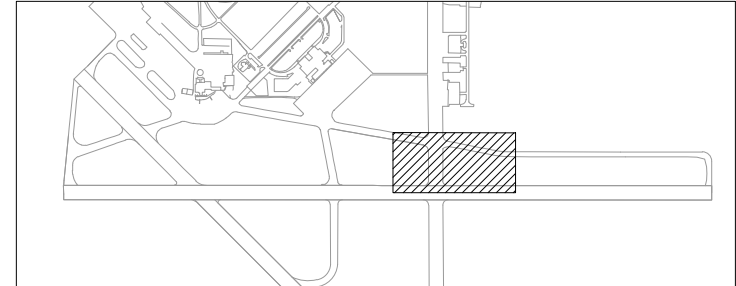
CAUTION NOTES:

- UNDERGROUND UTILITIES EXIST WITHIN AND ADJACENT TO THE LIMITS OF CONSTRUCTION. AN ATTEMPT HAS BEEN MADE TO LOCATE THESE UTILITIES ON THE PLANS, HOWEVER, ALL EXISTING UTILITIES MAY NOT BE SHOWN AND THE ACTUAL LOCATIONS OF THE UTILITIES MAY VARY FROM THE LOCATIONS SHOWN. PRIOR TO BEGINNING ANY TYPE OF EXCAVATION, THE CONTRACTOR SHALL CONTACT THE UTILITIES INVOLVED AND MAKE ARRANGEMENTS FOR THE LOCATION OF THE UTILITIES ON THE GROUND. THE CONTRACTOR SHALL MAINTAIN THE UTILITY LOCATION MARKINGS UNTIL THEY ARE NO LONGER NECESSARY.
- TEXAS STATE LAW, THE UNDERGROUND FACILITIES DAMAGE PREVENTION ACT, REQUIRES TWO WORKING DAYS ADVANCE NOTIFICATION THROUGH THE TEXAS ONE-CALL SYSTEM CENTER BEFORE EXCAVATING USING MECHANIZED EQUIPMENT OR EXPLOSIVES (EXCEPT IN THE CASE OF AN EMERGENCY). THE ONE-CALL SYSTEM PHONE NUMBER IS 1-800-245-4545. THE CONTRACTOR IS ADVISED THAT THERE IS A SEVERE PENALTY FOR NOT MAKING THIS CALL. NOT ALL UTILITY COMPANIES ARE MEMBERS OF THE TEXAS ONE-CALL SYSTEM; THEREFORE, THE CONTRACTOR IS ADVISED TO CONTACT ALL NON-MEMBER UTILITIES AS WELL AS THE ONE-CALL SYSTEM.

INSTALLATION KEYED NOTES:

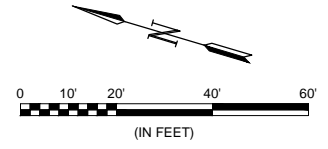
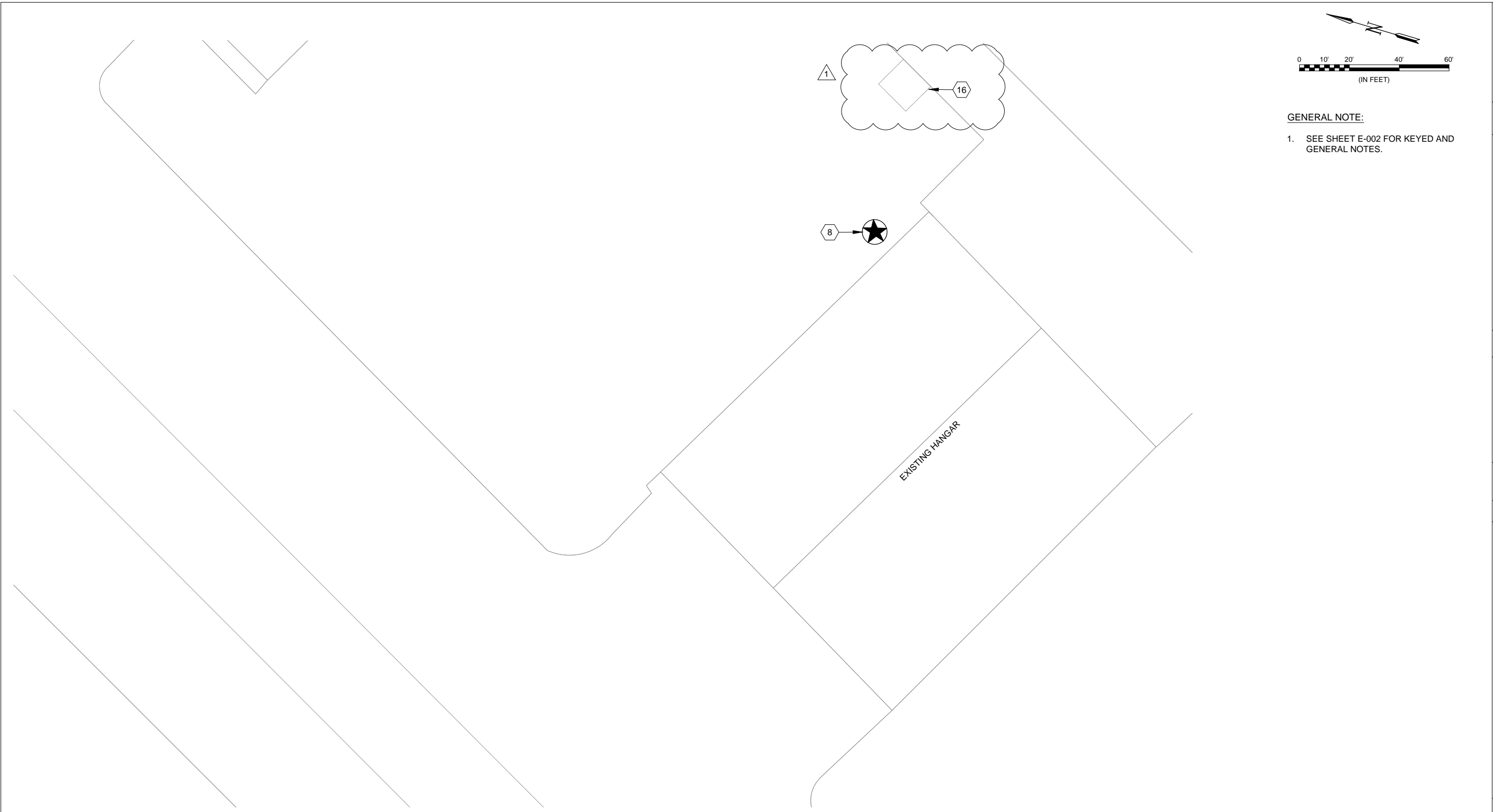
- INSTALL NEW L-861T(L) BASE-MOUNTED TAXIWAY EDGE LIGHT. (TYPICAL)
- INSTALL NEW TRENCH TYPE "A". (TYPICAL)
- INSTALL NEW TRENCH TYPE "B". (TYPICAL)
- INSTALL NEW BASE-MOUNTED L-858(L) GUIDANCE SIGN. SEE SHEET E-304 FOR SIGN INDEX.
- INSTALL NEW TRENCH TYPE "C". (TYPICAL FOR CONDUIT INSTALLED IN EXISTING PAVEMENT)
- INSTALL NEW L-861T(L) BASE-MOUNTED TAXIWAY EDGE LIGHT ON EXISTING BASE. (TYPICAL OF 12)
- INSTALL NEW AIRFIELD CIRCUIT IN EXISTING CONDUIT.
- INSTALL NEW AIRFIELD CIRCUIT IN EXISTING ELECTRICAL DUCT BANK.
- INSTALL NEW 2 FT WATERTIGHT CONDUIT STUB-OUT FOR CONNECTION OF EXISTING DEB CIRCUIT TO NEW AIRFIELD CIRCUIT. SPLICE EXISTING CONDUCTORS TO NEW CONDUCTORS UTILIZING DEB SPLICE. INSTALL NEW DUCT MARKER AT SPLICE LOCATION.
- INSTALL NEW SURGE ARRESTOR IN LINE WITH THE SERIES CIRCUIT. INSTALL BRASS INPAVEMENT MARKER ON CONCRETE LIGHT BASE ENGRAVED WITH "SA".
- INSTALL DRAINABLE AGGREGATE AREA AT INDICATED EDGE LIGHT. SEE DRAIN NOTE ON SHEET E-301, DETAIL 1, NOTE 4.

KEYMAP



File: I:\2016\16121501 - bpt tw d phase 3 rd & bidding\Drawings\BPT_TWD_E201_RL.dwg Last Save: 8/15/2016 4:12 PM Last Saved by: MCLemay
Last Plotted by: Lemay, Matthew C Plot Date: 8/15/2016 4:15 PM Plotter Used: vglvxd02i;Canon IR C4080 PS

File: I:\2016\16121501 - bpt tw d phase 3 rd & bidding\Drawings\BPT_TWD_E203_RL.dwg Last Save: 8/15/2016 11:27 AM Last saved by: MCL\leMay
 Last plotted by: leMay, Matthew C Plot Date: 8/15/2016 4:16 PM Plotter used: DWG To PDF.pc3



GENERAL NOTE:
 1. SEE SHEET E-002 FOR KEYED AND GENERAL NOTES.

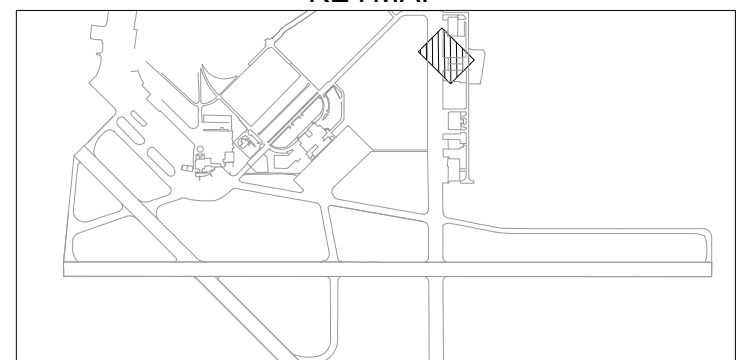
CAUTION NOTES:

- UNDERGROUND UTILITIES EXIST WITHIN AND ADJACENT TO THE LIMITS OF CONSTRUCTION. AN ATTEMPT HAS BEEN MADE TO LOCATE THESE UTILITIES ON THE PLANS, HOWEVER, ALL EXISTING UTILITIES MAY NOT BE SHOWN AND THE ACTUAL LOCATIONS OF THE UTILITIES MAY VARY FROM THE LOCATIONS SHOWN. PRIOR TO BEGINNING ANY TYPE OF EXCAVATION, THE CONTRACTOR SHALL CONTACT THE UTILITIES INVOLVED AND MAKE ARRANGEMENTS FOR THE LOCATION OF THE UTILITIES ON THE GROUND. THE CONTRACTOR SHALL MAINTAIN THE UTILITY LOCATION MARKINGS UNTIL THEY ARE NO LONGER NECESSARY.
- TEXAS STATE LAW, THE UNDERGROUND FACILITIES DAMAGE PREVENTION ACT, REQUIRES TWO WORKING DAYS ADVANCE NOTIFICATION THROUGH THE TEXAS ONE-CALL SYSTEM CENTER BEFORE EXCAVATING USING MECHANIZED EQUIPMENT OR EXPLOSIVES (EXCEPT IN THE CASE OF AN EMERGENCY). THE ONE-CALL SYSTEM PHONE NUMBER IS 1-800-245-4545. THE CONTRACTOR IS ADVISED THAT THERE IS A SEVERE PENALTY FOR NOT MAKING THIS CALL. NOT ALL UTILITY COMPANIES ARE MEMBERS OF THE TEXAS ONE-CALL SYSTEM; THEREFORE, THE CONTRACTOR IS ADVISED TO CONTACT ALL NON-MEMBER UTILITIES AS WELL AS THE ONE-CALL SYSTEM.

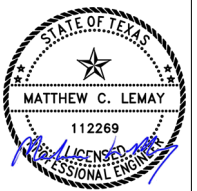
INSTALLATION KEYED NOTE:

- 8 REMOVE EXISTING ROTATING BEACON LIGHT. INSTALL A NEW L-802A HIGH INTENSITY ROTATING BEACON AND RECONNECT TO EXISTING CIRCUIT
- 16 PROVIDE NEW BATTERY BACKUP SYSTEM WITH BATTERIES, INVERTER, AND CONTROL PANEL TO PROVIDE A MINIMUM OF TWELVE (12) HOURS OF RUNTIME FOR THE NEW L-802A BEACON. SYSTEM SHALL BE HOUSED WITHIN A NEMA 3R RATED ENCLOSURE.

KEYMAP



REGISTRATION NO.
F-5713



DIGITALLY SIGNED
08/15/2016

REV	DATE	DESCRIPTION	BY
1	8/15/16	ADDENDUM # 2	MCL

JACK BROOKS REGIONAL AIRPORT
JEFFERSON COUNTY, TX
TAXIWAY D RECONSTRUCTION (2016)

LIGHTING
INSTALLATION
PLAN III

JOB NO.: 16121501
DATE: JULY, 2016
DESIGNED BY: MCL
DRAWN BY: JKS

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DRAWING NUMBER
E-203

SHEET NUMBER
56

ITEM SS-120 SITE PREPARATION

DESCRIPTION

120-1.1 This item covers the preparation of the site for construction of the proposed improvements. The attention of the bidder is directed to the necessity for careful examination of the entire project site to determine, at the time of bid preparation, the full extent of work to be done under the item "Site Preparation." The entire job site shall be cleared of all man-made obstructions and debris, of whatever nature, and made ready in all respects for the construction of the proposed improvements.

The item "Site Preparation" shall include:

1. Mobilization
2. Furnishing Temporary Field Office
3. Lighted Barricades and Closed Taxiway and Runway Markings
4. Temporary Relocated Threshold
5. Contractor's Access/Haul Road
6. Contractor's Staging Areas
7. Lockout/Tagout Program
8. Airport Security Requirements
9. Airport Safety Requirements
10. Instrument Control
11. Clean Up

CONSTRUCTION METHODS

120-2.1 MOBILIZATION. The Contractor shall consider and include his cost for providing personnel, equipment, materials, bonds, etc. required for the prosecution of the work under this item. This is in unison with Mobilization as described in the General Conditions Section 105.

120-2.2 FURNISHING TEMPORARY FIELD OFFICE. The building for the temporary field office shall be for the exclusive use by the Engineer as a field office and shall conform to the requirements listed below. The dimensions and other requirements specified herein are minimums and the building may be built by the Contractor for the specific purposes noted herein. It is not intended, however, to prohibit the use of commercially built trailers or prefabricated buildings which may deviate in minor dimension or detail from the requirements listed herein but may in some features exceed the listed requirements and in all major respects be entirely suitable for the purpose intended. The Engineer will determine the suitability of any building furnished. It shall be the responsibility of the Contractor to coordinate and obtain also necessary permits and install all required temporary facilities to provide a complete and usable temporary field office.

Minimum requirements for offices:

a. The building may be portable or other suitable type with 7-ft minimum ceiling height; must be floored, weatherproof and reasonably dustproof; must have at least two glazed sliding windows provided with window latches; must have at least one door provided with a substantial lock and all keys placed in the possession of the Engineer. Doors and windows shall be screened. The building need not be new but the facility furnished under this item shall be neat, clean, sound and usable for the purpose intended.

b. The building shall be provided with electric lights and power outlets arranged as directed by the Engineer. The building shall be provided with equipment in good working order. In cold weather the building shall be provided with adequate vented space heating facilities and fuel for heating. In hot

weather the building shall be equipped with adequate air conditioning units. Heating and cooling and telephone utility service will be furnished at no cost to the Owner or Engineer.

c. The building for the field office shall provide not less than 240 sq. ft. of floor space. At least two tables each suitable for desk and drafting table work shall be provided with approximate dimensions of 30" x 48". These tables may be movable, attached to a wall, or built-in. Each table will be provided with at least two drawers (minimum dimensions: 8" deep x 12" wide by 24" long) or equivalent cabinet or shelf space for storing field books and records.

d. The building shall be provided with internet access with a minimum download speed of 24 megabytes per second. This service shall be provided for the length of the contract or construction project, whichever is greater.

Furnishing the field office will not be measured for separate payment, but will be considered subsidiary to "Site Preparation." The building shall remain the property of the Contractor and be returned to him at the close of the construction period.

120-2.3 LIGHTED BARRICADES AND CLOSED TAXIWAY AND RUNWAY MARKINGS. The Contractor shall furnish, install, maintain, and remove closed taxiway and runway markings and lighted barricades in accordance with details on the plans and as directed by the Engineer. ~~The closed runway markers shall be aviation yellow, nylon reinforced vinyl.~~ The markers shall be secured to the pavement/ground as shown on the plans and as directed by the Engineer. The lighted barricades shall be constructed and installed as shown on the plans. All lighted barricades and closed taxiway and runway markings shall be constructed in accordance with AC 150/5370-2F Operational Safety on Airports During Construction.

All work involved in the furnishing, installation, maintenance, and removal of lighted barricades, **and** barrels ~~and closed runway markings~~ will not be measured for separate payment, but will be considered subsidiary to the bid item "Site Preparation."

Runway closure markers are as shown in the plans, and are towable to quickly position and remove. Runway closure markers are to include providing a marker for each runway threshold for the closed runway and will be measured in pairs of units as each runway closure marker. All work involved in the furnishing, installation, maintenance, and removal of lighted runway closure markers will be measured by the day – a twenty-four (24) hour period – of when the closure marker is in use on a runway closure.

120-2.4 CONTRACTOR'S ACCESS/HAUL ROAD. The Contractor shall layout, construct, maintain, and repair all access/haul roads needed to construct the work. The contractor shall video the any intended haul routes from the edge of airport property to the construction work areas. The existing access roads shown on the plans shall be repaired, as determined necessary by the Engineer, at the close of the project. All such work, including all materials and labor, involved in the layout, construction, maintenance, and repair of the Contractor's access/haul roads will not be measured for separate payment but will be considered subsidiary to the bid item "Site Preparation." Temporary pipe culverts shall be installed and maintained as required and shall be of the size as directed by the Engineer. The type of pipe used for temporary pipe shall be at the option of the Contractor. Temporary pipe culverts will not be measured for separate payment, but will be considered subsidiary to the access/haul road. All temporary pipe culverts shall be removed by the Contractor and shall remain his property at the close of the project.

120-2.5 CONTRACTOR'S STAGING AREAS. The areas designated in the plans or by the Engineer as the Contractor's staging area shall be cleared and graded by the Contractor as needed for use by the Contractor in constructing the work on this project. All areas used or otherwise occupied by the Contractor for his operations shall be cleaned, regraded, and seeded, as directed by the Engineer, prior to the final acceptance of the project by the Airport. All work involved in the preparation and restoration of areas used or occupied by the Contractor, including clearing, grubbing, regrading, seeding, and installing and removing fence, will not be

measured for separate payment but will be considered subsidiary to the bid item "Site Preparation."

120-2.6 LOCKOUT / TAGOUT PROGRAM. The Contractor shall submit a complete copy of an electrical energy source Lockout/Tagout Program in accordance with Part 1910 – Occupational Safety and Health Standards (OSHA) Subpart S – Electrical, that meets the requirements of 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout), including requirements listed in 1910.331 through 1910.335. Implementation of the Lockout/Tagout Program and the related safety requirements are the sole responsibility of the Contractor.

120-2.7 AIRPORT SECURITY REQUIREMENTS. The Contractor shall abide by the Airport Security requirements that are outlined in the Construction Safety and Phasing Plan (CSPP) of the plans. Any costs associated with the Airport Security requirements will not be measured for separate payment but will be considered subsidiary to the bid item "Site Preparation."

120-2.8 AIRPORT SAFETY REQUIREMENTS. The Contractor shall abide by the Airport Safety requirements that are outlined in the Construction Safety and Phasing Plan (CSPP) of the plans. All costs associated with the Airport Safety requirements will not be measured for separate payment but will be considered subsidiary to the bid item "Site Preparation."

120-2.9 INSTRUMENT CONTROL. The Contractor will be furnished survey baselines and benchmarks to control the work as shown on the Plans. The Contractor shall be responsible for the additional instrument control necessary to layout and construct the work. The Contractor shall provide the instrument control as provided for in Section 50 of the General Provisions. The Contractor's instrument control of the work shall not be measured for separate payment, but will be considered subsidiary to the bid item "Site Preparation".

120-2.10 CLEAN UP. From time to time, the Contractor shall clean up the site in order that the site presents a neat appearance and that the progress of work will not be impeded. One such clean up shall immediately precede final inspection.

Immediately following acceptance of the work by the Owner, the Contractor shall remove all temporary equipment, surplus materials, and debris resulting from his operations, and leave the site in a condition fully acceptable to the Owner.

MEASUREMENT AND PAYMENT

120-3.1 Site preparation will be measured as a lump sum complete item. Work completed and accepted under this item will be paid for at the contract lump sum price bid for "Site Preparation," which price shall be full compensation for furnishing all labor, tools, equipment and incidentals necessary to complete the work.

120-3.2 Lighted Runway Closure Markers will be paid for at the contract price bid. This price shall be full compensation for furnishing all labor, tools, equipment and incidentals necessary to provide runway closure markers for those periods of time as called for by time of day and work area.

Payment will be made under:

Item SS-120-1 Site Preparation - per Lump Sum

A minimum of two (2) partial payments will be made for Site Preparation up to a limit based on a percentage of the Total Contract Value and not the amount bid. Periodic payments will be made in proportion to the amount of work accepted for payment in monthly pay applications, as outlined in the table below.

Monthly Pay Application Total exceeds	Partial Payment of Site Preparation
1% of total Contract value	50% of Site Preparation, <u>up to 2.5% of total Contract value, less retainage</u>
5% of total Contract value	100% of Site Preparation, <u>up to 5% of total Contract value, less retainage</u>

Any remaining partial payments for “Site Preparation” will be when the work is completed to 95% of the Contract total value.

Item SS-120-2 Lighted Runway Closure Markers – per day

END OF ITEM SS-120

ITEM SS-300 BASIC ELECTRICAL REQUIREMENTS

DESCRIPTION

300-1.1 This item shall consist of furnishing and installing complete electrical systems as defined in the plans and in these specifications. The work includes the installation, connection and testing of new electrical systems, equipment and all required appurtenances to construct and demonstrate proper operation of the completed electrical systems.

300-1.2 The Contractor shall maintain current copies of all referenced and applicable advisory circulars and standards on the job site. The Contractor is responsible to make known to the Engineer any conflict between plans and specifications that he observes or of which he is made aware.

300-1.3 This work shall consist of lockout/tagout and constant current regulator calibration procedures at the airport electrical vault in accordance with the design and details shown in the plans and in compliance with these specification documents.

EQUIPMENT AND MATERIALS

300-2.1 STANDARDS.

- to:
- a. Applicable National Fire Protection Association (NFPA) codes, including but not limited to:
 - (1) NFPA 70 - National Electrical Code.
 - (2) NFPA 70E - Standard for Electrical Safety in the Workplace.
 - (3) NFPA 101 - Life Safety Code.
 - (4) Internet Website: <http://www.nfpa.org>
 - b. Applicable Code of Federal Regulations (CFR) codes, including but not limited to:
 - (1) 29 CFR 1910 - Occupational Safety and Health Standards (OSHA)
 - (2) 29 CFR 1926 - Safety and Health Regulations for Construction.
 - (3) Internet Website: <http://www.gpoaccess.gov/cfr/index.html>
 - c. ANSI/IEEE C2 - National Electrical Safety Code.
 - d. NECA 1 – Standard for Good Workmanship in Electrical Construction.
 - e. Applicable Federal, State and Local Electrical Codes.
 - f. Applicable Federal, State and Local Energy Codes.
 - g. Applicable Federal, State and Local Building Codes.
 - h. Applicable Federal, State and Local Fire Codes.
 - i. Applicable City Electrical Code.
 - j. Applicable City Ordinances pertaining to electrical work.
 - k. Applicable Federal, State and Local - Environmental, Health and Safety Laws and Regulations.

Contractor shall utilize the most current editions of standards, which are current at time of bid and as recognized by the Authority Having Jurisdiction for the respective standard.

300-2.2 GENERAL.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified and listed under Advisory Circular (AC) 150/5345-53, Airport Lighting Equipment Certification Program, current version on the date that the submittals are received by the Engineer.

b. Airport lighting equipment and materials shall also meet the Buy American Preference requirements in 49 USC 50101 and the Aviation Safety and Capacity Expansion Act. The equipment

shall be approved and listed on the FAA "Equipment Meeting Buy American Requirements" list located at www.faa.gov/airports/aip/procurement/federal_contract_provisions/, current version on the date that the submittals are received by the Engineer, or the Contractor may submit a signed formal letter from the manufacturer that clearly lists the specific equipment, model number, location where it is manufactured, and statement certifying that the equipment and/or materials meet the Buy American Preference requirements.

c. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the Engineer. All equipment and materials shall be new and meet applicable manufacturer's standards. All other electrical components and products, not covered under the FAA equipment certification program, shall be tested and listed by an OSHA accepted, nationally recognized testing laboratory (NRTL) to conform to the standards indicated in these contract documents and to the industry standards required in the NEC, NEMA, IEEE, UL, and applicable FAA advisory circulars.

d. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications and acceptable to the Engineer. Materials supplied and/or installed that do not materially comply with these specifications shall be removed, when directed by the Engineer and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

e. All materials and equipment used to construct this item shall be submitted to the Engineer for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components or electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be boldly and clearly made with arrows or circles (highlighting is not acceptable). Contractor is solely responsible for delays in project accruing directly or indirectly from late submissions or resubmissions of submittals.

f. The data submitted shall be sufficient, in the opinion of the Engineer, to determine compliance with the Contract Documents plans and specifications. The Engineer reserves the right to reject any and all equipment, materials or procedures, which, in the Engineer's opinion, does not meet the system design and the standards and codes, specified herein.

g. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

- (1) All LED light fixtures, with the exception of obstruction lighting, shall be warranted by the manufacturer for a minimum of 4 years after date of installation, final acceptance testing by the Engineer, and Owner's beneficial use of the equipment, inclusive of all electronics. Refer to FAA Engineering Brief No. 67D for additional requirements.

h. Refer to Special Provisions item C-12 Submittals for electronic or paper submittal requirements for Engineer's review.

i. After approval of submitted equipment, the Contractor shall supply the following Operation and Maintenance Manual documentation to the Owner. Two (2) complete sets of documentation shall be supplied for each model of equipment. The documentation shall be securely bound in heavy-duty 3-ring binders. The information for each piece of equipment shall be indexed using typewritten label tabs. The

spine of each binder shall have a typewritten label, which indicates the included equipment types. The documentation shall include:

- (1) Approved Submittals and Shop Drawings
- (2) Cable Splicer Qualifications, Type and Voltage
- (3) State Contractors License with Electrical Classification
- (4) Master, Journeyman and Apprentice Electrician Licenses and Certifications
- (5) Lockout/Tagout Program
- (6) Regulator Load and Calibration Reports for testing, checking and adjusting all regulators in the electrical vault
- (7) Megger Test Reports
- (8) Ground Rod Test Reports
- (9) Installation Manuals
- (10) Operation Manuals
- (11) Maintenance Manuals
- (12) Parts Lists, including recommended spare parts. Recommended spare parts shall be furnished with the respective equipment.
- (13) Bolt torque requirement shop drawings and calculations

j. After approval of the O&M Manuals, the Contractor shall provide three (3) complete electronic copies of all documentation in Adobe PDF file format on CD-R (non-rewriteable) discs storage media. The electronic files shall contain searchable text and include a hyperlink index for ease in locating information with the PDF file.

- (1) Electronic PDF copies of the O&M manuals shall be saved within a "specific job number and project name" folder on the ALCMS computer system.

k. All requirements herein Item SS-300 shall be applicable to all referenced sections in these contract documents and applicable to all sections which reference Item SS-300.

l. The Contractor is the single source of responsibility for the installation and integration of the airport's lighting, power, and control systems. New airport lighting equipment and materials shall be fully compatible with all other new and existing airport lighting equipment and systems. Any non-compatible components furnished by the Contractor shall be replaced at no additional cost to the Owner with a similar unit that is approved by the Engineer and compatible with the remainder of the airport lighting system.

300-2.3 OPERATION AND MAINTENANCE DATA.

Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment. Provide bound hard copies and electronic copies as noted in section 300-2.2.

a. Certificate of Substantial Completion, Release and Contractor's Affidavit, executed copies.

b. Final approved equipment submittals, including product data sheets and shop drawings, clearly labeled.

c. Preventive maintenance programs for the visual aid facilities and equipment installed in this project, including the applicable equipment sections within Chapter 5 "Preventive Maintenance" from AC 150/5340-26 (latest edition) "Maintenance of Airport Visual Aid Facilities".

d. Installation manuals: Description of function, installation and calibration manuals, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.

e. Operations manuals: Manufacturer's printed operating instructions and procedures to include start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shutdown, and emergency instructions; summer and winter operating instructions; and all programming and equipment settings.

f. Maintenance manuals: Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.

g. Service manuals: Servicing instructions and lubrication charts and schedules, including the names and telephone numbers of personnel to contact for both routine periodic and warranty service for equipment and materials provided under this Specification.

h. Final test reports, clearly labeled, including but not limited to, insulation resistance test reports, ground rod impedance test reports, cable pulling tension values logs, and equipment certification tests.

i. Final certified calibration sheets for all equipment and instruments, including but not limited to, constant current regulator calibration reports.

300-2.4 WIRE.

Unless otherwise indicated, conductors No. 10 AWG and smaller shall be solid, and conductors No. 8 AWG and larger shall be stranded.

For electrical work of 600 volts or less, all conductors, terminations, terminal blocks, lugs, connectors, devices and equipment shall be listed, marked, and rated 75 degrees C minimum unless otherwise noted.

Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway. Pull ropes and pull wires shall have sufficient tensile strength for the cable(s) to be pulled and installed. Damaged cable or raceway shall be replaced at no additional cost to the Owner.

Install pull wires in empty raceways. Use a polypropylene plastic line with not less than 200 pound tensile strength. Secure and leave at least 12 inches of slack at each end of pull wire to prevent it from slipping back into the conduit. Cap spare raceways with removable tapered plugs, designed for this purpose.

Colorable L-824 cable in solid non-fading colors shall not be used for permanent series circuit identification.

300-2.5 CONCRETE. Concrete shall conform to Item P-610, Structural Portland Cement Concrete, with a minimum 28-day compressive strength of 3500 PSI (unless otherwise noted) using 1-inch (25-mm) maximum size coarse aggregate, as determined by test cylinders made in accordance with ASTM C 31 and tested in accordance with ASTM C 39.

Flowable backfill material may only be used where specifically indicated in the Plan details.

300-2.6 BEACON BATTERY BACKUP SYSTEM. The battery backup system for the beacon shall provide a minimum runtime of twelve (12) hours and shall be provided with a NEMA 3R rated weatherproof enclosure, exterior indicator lights, and automatic battery testing. The system shall consist of batteries, inverter, control panel, and surge suppression for a full and complete system. The system components shall be provided by a single manufacturer. The system shall be provided with a three (3) year warranty. The Contractor shall submit wiring diagrams and shop drawings for review and approval prior to construction.

CONSTRUCTION METHODS

300-3.1 LOCKOUT/TAGOUT PROGRAM. The Contractor shall provide a complete copy of an electrical energy source Lockout/Tagout Program to the Owner, with copy to the Engineer. The document shall clearly identify the on-site master electricians and their contact information, including office and mobile telephone numbers.

The Lockout/Tagout Program shall comply with Part 1910 – Occupational Safety and Health Standards (OSHA) Subpart S – Electrical, and meet the requirements of 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout), including requirements listed in 1910.331 through 1910.335.

Implementation of the Lockout/Tagout Program and all other related safety requirements are the sole responsibility of the Contractor.

300-3.2 SAFETY PROGRAM. The Contractor shall implement an electrical safety program that complies with NFPA 70E and 29 CFR 1926.

Implementation of the Electrical Safety Program, determining and providing proper Personal Protective Equipment (PPE), training and enforcing personnel to wear the prescribed PPE, conducting work area safety inspections (including correcting deficiencies), and all other related safety requirements are the sole responsibility of the Contractor.

All work involved in the preparation and implementation of the safety program will not be measured for separate payment, but will be considered subsidiary to the lockout/tagout bid item.

300-3.3 PRECONSTRUCTION MEETING.

A preconstruction meeting will be held with the Airport, FAA, Engineer and Contractor, prior to any work. Complete submittals and shop drawings will be submitted at this time for review. An equipment procurement schedule will be provided by the Contractor with an anticipated field construction start date. The progress construction schedule will be submitted for review each week and shall outline all installation, testing and demolition work.

300-3.4 GENERAL. In general, the various electrical equipment and material to be installed by the various trades under this specification shall be run as indicated, as specified herein, as required by particular conditions at the site, and as required to conform to the generally accepted standards so as to complete the work in a neat and satisfactory manner. The following is a general outline concerning the running of various systems and is to be excepted where the drawings or conditions at the buildings necessitate deviating from these standards.

The drawings and specifications are complementary; any work required by one, but not by the other, shall be performed as though required by both.

All conduits shall be run exposed in the equipment rooms, or run concealed as indicated.

The construction details of the building are illustrated on the drawings. Each Contractor shall thoroughly acquaint himself with the details before submitting his bid as no allowances will be made because of the Contractor's unfamiliarity with these details.

The electrical plans do not give exact locations, etc., and do not show all the offsets, control lines, junction boxes, and other installation details. Each Contractor shall carefully lay out his work at the site to conform to the job conditions, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and thereby to provide complete operating systems.

The electrical plans show diagrammatically the locations of the various electrical outlets and apparatus and the method of circulating and controlling them. Exact locations of these outlets and apparatus shall

be determined by reference to the general plans and to all detail drawings, etc., by measurements at the buildings, and in cooperation with other crafts, and in all cases shall be subject to the approval of the Engineer. The Engineer reserves the right to make any reasonable change in location of any outlet or apparatus before installation, without additional cost to the Owner.

These Specifications and the accompanying Drawings are intended to cover systems which will not interfere with the structure of the buildings, which will fit into the several available spaces, and which will insure complete and satisfactory systems. Each bidder shall be responsible for the proper fitting of his material and apparatus into the buildings.

Should the particular equipment which any bidder proposes to install require other space conditions than those indicated on the Drawings, he shall arrange for such space with the Engineer before submitting his bid. Should changes become necessary on account of failure to comply with this clause, the Contractor shall make such changes at the Contractor's expense.

Should the particular equipment which any bidder proposes to install require other installation methods, such as larger light base junction structures, etc., he shall include all such equipment and appurtenances in his bid. Should changes become necessary on account of failure to coordinate equipment requirements and comply with this clause, the Contractor shall make such changes at the Contractor's expense.

The Contractor shall be responsible to see that each party furnishes electrical equipment which meets the electrical requirements specified herein and that all systems work together to produce the specified operation.

Where two or more units of the same kind or class of equipment are required, these shall be products of a single manufacturer; however, the component parts need not be the products of one manufacturer.

Each Contractor shall submit working scale drawings of all his apparatus and equipment which in any way varies from these Specifications and Plans, which shall be checked by the Engineer and approved before the work is started, and interferences with the structural conditions shall be corrected by the Contractor before the work proceeds.

Electrical equipment, such as switchgear, switchboards, panelboards, load centers and other power supply equipment, shall not be used as a common enclosure, pull box or junction box for routing conductors of different systems, unless the equipment is specifically designed for this purpose and indicated as such on the Plans.

All electrical equipment shall be securely mounted as indicated in the plans, as required by the contract specifications, as required by guidelines and codes, and as required by the manufacturer using hardware compliant with the environmental conditions.

Interior components of electrical enclosures shall be securely mounted using appropriate hardware within the enclosure. Adhesives or adhesive tapes/strips are not allowed and are prohibited.

Electrical components, including but not limited to, relays, circuit boards, electronics, etc, shall be installed within approved enclosures.

The Contractor shall keep ends of conduits, including those extending through roofs, equipment and fixtures covered or closed with caps or plugs to prevent foreign material from entering during construction.

Where portions of raceways are known to be subjected to different temperatures, where condensation is a problem, and where passing from interior to exterior of a building, the portion of raceway or sleeve shall be filled with an approved material to prevent the circulation of air, prevent condensation, and prevent

moisture entry. Sealing of raceways shall not occur until after the conductors and cables have been installed, tested and accepted by the Engineer.

The Contractor shall install any temporary lines and connections required to maintain electric services and safely remove and dispose of them when complete.

All temporary wiring shall conform to OSHA standards. Remove temporary services when work is complete. Any damage to electrical equipment caused by the Contractor shall be repaired at no cost to the Owner.

All non-current carrying parts and neutrals shall be grounded as indicated on the Drawings or as required by the Codes.

White and/or gray outer finish conductors may only be used as grounded conductors or neutral conductors in accordance with NEC.

Install insulated green equipment grounding conductors with all feeder and branch circuits.

Provide separate insulated equipment grounding conductors from grounding system to each electrical equipment, telecommunication equipment, other special electrical system equipment, and appurtenance item location in accordance with NFPA 70 and other applicable standard requirements.

The bidder shall inspect the site, thoroughly acquaint himself with conditions to be met and work to be accomplished. Failure to comply with this shall not constitute grounds for any additional payments.

Where electrical equipment is installed that causes electrical noise interference with other systems either existing or installed under this contract, the offending equipment shall be equipped with isolating transformers, filters, reactors, shielding, or any other means as required for the satisfactory suppression of the interferences, as determined by the Engineer.

All junction boxes, expansion joints, flexible connections, instruments and similar items requiring servicing or repairs shall be installed in an accessible location.

All salvage and equipment removed by the work shall remain the property of the Owner. Material removed from the project shall be stored on the project site where and as directed. Debris shall be removed from the job site and disposed of by the Contractor.

The Contractor shall maintain his work area clean and orderly at all times. Debris shall be removed promptly. The electrical system shall be thoroughly cleaned inside and outside of all enclosures to remove all metal shavings or other work debris, dust, concrete splatter, plaster, paint and lint.

The Contractor shall do all excavating and backfilling made necessary by electrical work and shall remove all surplus or supply any earth required to establish the proper finished grade.

The Contractor shall do all cutting and patching made necessary by electrical work, but in no case shall he cut through or into any structural member without written permission of the Engineer.

All steel conduits, supports, channels, fittings, nuts, bolts, etc. shall be galvanized, corrosion-resistant type unless otherwise noted.

An approved anti-seize compound shall be used on all threads to prevent equipment and thread damage.

Equipment shall be installed in accordance with manufacturer's recommendation. Make all final electrical connections and coordinate all items with other trades.

Correct unnecessary damage caused due to installation of work, brought about through carelessness or

lack of coordination. All openings, sleeves, and holes to be properly sealed, fire proofed and water proofed. Any water leaks arising from project construction will be immediately corrected to the satisfaction of the Owner and the Engineer.

300-3.5 BACKFILL, COMPACTION, AND RESTORATION. Refer to the backfill, compaction and restoration requirements within Item P-152 where other compaction requirements are specified (under pavements, embankments, etc.)

Trenches shall be backfilled and compacted in 6" layers to 90% maximum density for cohesive soils and to 100% maximum density for non-cohesive soils, as determined by ASTM D1557. The in-place field density shall be determined in accordance with ASTM D1556, D2167, or D6938.

Backfilling from two directions will not be allowed. No backfilling will be accomplished without the approval of the Engineer or Construction Observer. The Contractor shall ensure all trenches are inspected prior to being covered and prior to encasement. Any uninspected trenches which are prematurely covered shall be exposed for inspection at the Engineer and Owner's convenience at no additional cost to the Owner. The Construction Observer will coordinate with the Contractor for advance scheduling of trench inspection.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

All concrete/asphalt pavement removal and repair work shall be installed as separate pay items in accordance with Specification P-101 Surface Preparation.

The subgrade below the removed pavement shall be compacted to 90% maximum density for cohesive soils and to 100% maximum density for non-cohesive soils, as determined by ASTM D1557. The in-place field density shall be determined in accordance with ASTM D1556, D2167, or D2922. Subgrade preparation will not be measured for separate payment, but will be considered subsidiary to Specification P-101 Surface Preparation.

300-3.6 CABLE AND UTILITY COORDINATION. The existing and the proposed locations of lighting cable are approximate. The Contractor shall be responsible for field locating and identifying the existing lighting circuits to determine their exact routing. The Contractor shall also be responsible for maintaining the lighting systems in a working condition until the new lighting circuits have been installed and tested. The Contractor shall proactively and expeditiously accomplish this cable identification work prior to performing any modifications to the lighting circuits. Coordinate identification work with the Owner and Engineer and make all corrections, additions, etc. on the as-built drawings.

Underground cable and utilities exist within and adjacent to the limits of construction. An attempt has been made to locate these cables and utilities on the Plans. All existing cable and utilities may not be shown on the Plans and the location of the cables and utilities shown may vary from the location shown on the Plans. Prior to beginning of any type of excavation, the Contractor shall contact the utilities, the airport maintenance staff, FAA field personnel and other organizations as required and make arrangements for the location of the utilities on the ground. The Contractor shall maintain the cable and utility location markings until they are no longer required.

The Contractor shall replace or repair any underground cable or utility that has been damaged by the Contractor during excavation to the satisfaction of the owner of the cable or utility at no additional cost to the Owner.

300-3.7 5 kV CABLE CONNECTIONS.

Cable splicing/terminating personnel shall be licensed electricians who have the minimum continuous experience in terminating/splicing medium voltage cable as listed in Item L-108. The qualifications for these airfield lighting cable splicers shall be submitted for review and approval by the Engineer prior to any work. The Engineer may request sample splices be performed in his presence by the proposed personnel to clearly demonstrate that they have the skill and experience to perform this work. Connector kits and cables shall be provided in sufficient quantity by the Contractor in demonstrating these qualifications at no additional cost to the Owner.

Field-attached plug-in splices using FAA certified L-823 plug and receptacle connector kits, properly sized to the cable being used, shall be installed as shown in the plans. This work shall include the taping and heat shrinking. Refer to Item L-108 for additional requirements.

As an option, the Contractor may utilize enhanced FAA certified L-823 connector kits, such as the Amerace 54Super Kit. These kits do not require taping or heat shrinking. These kits shall be installed in accordance with the manufacturer's installation requirements. Note that the mixing of connector kits is unacceptable. The Contractor shall clearly list and submit the connector kits he proposes to utilize on the project for approval prior to any field construction work, and he shall only install that type during construction unless otherwise noted by the Engineer.

300-3.8 REMOVAL AND RELOCATION OF EXISTING EQUIPMENT. The Contractor shall carefully remove all salvageable equipment as indicated on the Plans. Any equipment which is damaged during the removal operation shall be subject to a reduction in payment for removal of the equipment. All equipment which is removed during this project shall be transported to a site on the Airfield or removed from the Airfield and properly disposed of as directed by the Owner and the Engineer.

The Contractor shall carefully relocate existing equipment as indicated in the Plans. Any equipment that is damaged during the relocation operation shall be replaced at no additional cost to the Owner.

Any existing electrical equipment, conduit, cables, etc. that is damaged during construction shall be replaced at no additional cost to the Owner to the satisfaction of the Owner and the Engineer.

300-3.9 CERTIFICATION AND PERFORMANCE. Equipment and materials covered by FAA Advisory Circulars are referred to by item numbers and approved equipment is listed within the AC 150/5345-53 Airport Lighting Equipment Certification Program's monthly Addendum, which contains a complete and updated listing of the certified equipment and manufacturers, and is listed in the FAA Buy American Preference equipment list, which is also updated monthly. The Contractor shall provide and install new certified equipment that works reliably and efficiently with the existing equipment to remain in service. The Contractor shall provide any additional accessories and/or appurtenances required to provide fully functional electrical systems to the satisfaction of the Owner and Engineer, at no additional cost to the Owner.

The Contractor shall ascertain that all lighting system components furnished (including FAA certified and approved equipment) are compatible in all respects with each other and the remainder of the new and existing systems. Any non-compatible components furnished by the Contractor shall be replaced at no additional cost to the Owner with a similar unit that is approved by the Engineer and compatible with the remainder of the airport lighting system.

300-3.10 AS-BUILT DRAWINGS. Before work is started, the Contractor shall obtain at his expense one (1) full-sized set of prints for As-Built records; the Engineer will supply the tracings at printing cost to the Contractor.

The Contractor shall locate all underground and concealed work, identifying all equipment, conduit, circuit numbers, motors, feeders, breakers, switches, and starters. The Contractor will certify accuracy by endorsement. As-Built drawings shall be correct in every detail, so Owner can properly operate, maintain, and repair exposed and concealed work.

The As-Built drawings shall indicate all control system labeling and marking.

The Contractor shall store the As-Built drawings on the site. Drawings shall not be rolled. Make corrections, additions, etc., with pencil, with date and authorization of change.

As-Built drawings must be submitted to Engineer before project will be accepted.

Minor deviations from the Plans and Specifications shall be as approved by the Engineer.

Upon completion of the installation, the Contractor shall adjust the systems to the satisfaction of the Engineer.

300-3.11 TESTING.

General Electrical Testing: Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification and certify compliance with test parameters. Tests shall be conducted in the presence of the Engineer and shall be to his/her satisfaction. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest. Perform infrared scan tests and inspections of service and power distribution equipment at the respective hangars and provide reports. Electrical equipment will be considered defective if it does not pass tests and inspections. Reports shall include notations of deficiencies, remedial action taken and observations after remedial action.

System and Equipment Testing: All installations shall be fully tested by continuous operation for not less than 24 hours as completed systems prior to acceptance. These tests shall include the functioning of each control not less than 10 times.

Airport lighting equipment and special systems shall be tested in accordance with applicable FAA Advisory Circular requirements and the manufacturer's installation instructions. These tests shall also include those system requirements listed within AC 150/5340-26 Maintenance of Airport Visual Aid Facilities.

Test equipment and instruments utilized by the Contractor shall have been calibrated following the manufacturer's recommended schedule to verify their accuracy prior to performing the testing work. The Contractor shall provide instrument calibration certificates on test equipment when requested by the Engineer. Retesting work due to inaccurate or defective instruments shall be performed by the Contractor to the satisfaction of the Engineer at no additional cost to the Owner.

a. Regulator Calibration:

The Contractor shall check and calibrate both new and existing regulators utilizing the enclosed "Constant Current Regulator Calibration Report". Refer to the material section on constant current regulators for additional requirements.

New regulators are calibrated at the factory prior to shipping, while existing regulators typically need checks and calibrations on a routine basis so that they do not get out of tolerance. The intent is to check and/or calibrate these regulators using a high accuracy meter prior to energizing and placing the airfield lighting system in service.

Utilize a high accuracy true RMS ammeter with high accuracy clamp-on current probe when making these measurements (use round type probes, accuracy + or - 2% required, sized per the cable diameter and circuit ampacity to achieve the best accuracy). Adjust regulators per manufacturer's instructions to meet the output currents on each brightness step as listed in Tables 5-2 and 5-3 in AC 150/5340-26.

b. Megger Testing:

The Contractor shall perform megger testing on each existing regulator circuit prior to any work on the electrical system. This information shall be recorded and documented by the Contractor and submitted to the Engineer. The Contractor shall perform megger tests on each regulator circuit after the acceptance test period. This acceptance test information shall be recorded and documented by the Contractor and submitted to the Engineer. Megger test shall be performed in accordance with the requirements of Item L-108.

The Contractor shall submit his initial megger test reports on the enclosed "Insulation-Resistance Test Report" form prior to any work on the electrical system. This report shall be submitted to the Engineer and approved by the Owner prior to Contractor proceeding with his work.

After final acceptance testing has been completed, the Contractor shall complete and submit his final megger test reports to the Engineer and insert copies of the initial and final megger test reports in the Operation and Maintenance Manuals.

Megger testing shall be performed using an insulation meter, such as a Fluke 1507 Insulation Resistance Multimeter, Ideal 61-797 Digital Insulation Meter, or approved equal having an insulation test range up to 10 Gigohms or greater.

Insulation resistance testers for 5kV series circuits shall utilize the 1000V DC source output for testing. The test equipment shall be submitted for review and approval by the Engineer prior to performing the tests.

The Contractor shall be responsible to maintain an insulation resistance equal to minimum 80% of the initial testing value through the end of the contract warranty period. This requirement is based on AC 150/5340-26C which states that resistance values inevitably decline over the service life of the circuit and that a 10-20 percent decline per year is considered normal. Note that AC 150/5340-26C cancels AC 150/5340-26B; thus refer to the current edition of the maintenance AC for requirements in this project.

For existing circuit insulation resistance requirements, refer to "Existing Circuits" section of Item L-108.

The installations shall be tested in operation as a completed unit prior to acceptance. Tests shall include taking megger and voltage readings in accordance with manufacturer's requirements. Testing equipment shall be furnished by the Contractor. The insulation resistance to ground for 600V rated cables shall be not less than 100 Megohms when measured per NETA standards.

c. Ground Rod Impedance Testing:

The enclosed "Ground Rod Impedance Test Report" form shall be used and testing shall be performed in the presence of the Engineer.

As-Built drawings shall indicate the location of all installed ground rods. Each ground rod shall have a unique identifier that corresponds with its submitted ground impedance test report.

Three-pole fall-of-potential testers that can measure the ground resistance of a ground rod using auxiliary electrodes (staked testing), such as a Fluke 1621 Earth Ground Tester, shall be used for testing individual dedicated equipment ground rods at fixtures and equipment, or for testing isolated counterpoise ground rods not yet connected to the counterpoise wire.

Clamp-on testers that can measure the ground resistance of a ground rod without using auxiliary ground rods (stakeless testing), such as a Fluke 1630 Earth Ground Clamp Meter or approved equal, shall be used for testing counterpoise ground rods which have already been connected to the counterpoise wire, or ground ring ground rods which have already been connected to the established ground ring system.

Ground impedance test equipment shall be submitted for review and approval by the Engineer prior to performing the tests.

If the ground rod's impedance exceeds 25 ohms, an additional rod shall be driven in a location suitable and approved by the Engineer. However, the additional rod must satisfy the requirements of NEC 250.53 and not be less than 6 feet away from any other ground rod electrode. Additional ground rods shall not be measured for separate payment but shall be considered subsidiary to the counterpoise or respective equipment pay item.

The Contractor shall perform additional tests if required and requested by the Engineer at no additional cost.

The Contractor shall coordinate with the resident Engineer to approve tests daily before proceeding. The Contractor shall fill out a separate test report for each date. Test reports shall be submitted weekly to the Engineer.

d. Cable Pulling Tension Values Log:

The enclosed "Cable Pulling Tension Values Log" form shall be used for monitoring cable pull tension values in the presence of the Engineer. Refer to Item L-108 for additional requirements.

For airport rotating beacons, test the completed beacon installation using approved photometric testing equipment. Beacons that require an additional shield or other device to prevent light spillage and thus affect photometric performance shall not be used.

300-3.12 INSPECTION FEES AND PERMITS. Obtain and pay for all necessary permits and inspection fees required for electrical installation.

300-3.13 WORK SUPERVISION.

State of Texas: The electrical contractor (whether the general contractor or a subcontractor) shall be a licensed contractor in the state of Texas having an electrical classification suitable for performing the work required in these contract documents.

The Contractor shall designate in writing the qualified electrical supervisor who shall provide supervision to all electrical work on this project. The minimum qualifications for the electrical supervisor shall be a master electrician as defined by Texas Electrical Safety and Advisory Board. The supervisor or his appointed alternate possessing at least a journeyman electrician license shall be on site whenever electrical work is being performed. The qualifications of the electrical supervisor shall be subject to approval of the Owner and the Engineer.

All master and journeyman electricians shall be licensed in accordance with Texas Board Requirements. The website located at <http://www.license.state.tx.us> publishes the text of this statutory requirement. No unlicensed electrical workers shall perform electrical work on this project. Apprentice electricians in a ratio of not more than one apprentice per journeyman electrician will be allowed if the apprentices are licensed and actively participating in an apprenticeship program recognized and approved by the Texas Electrical Safety and Advisory Board.

Refer to specification section L-108-2.5 "Splicer Qualifications" for additional requirements.

300-3.14 TRAINING. The training classes shall be coordinated with the Owner and Engineer in advance of the final acceptance testing. Comprehensive operational and maintenance training materials shall be provided by the equipment manufacturer and the Contractor (see section 2.3 OPERATION AND MAINTENANCE DATA).

- a. Operations and Maintenance:
 - (1) Provide a minimum of one (1) 4-hour class for training.
 - (2) The class size shall be maximum of 4 people.
 - (3) The location will be at the discretion of the Airport.
 - (4) Equipment
 - i. L-861T Taxiway Edge Light
 - ii. L-850C Flush-Mounted Runway Edge Light
 - iii. L-858 Guidance Signs
 - iv. L-867 Junction Structures
 - v. L-830 Isolation Transformers
 - vi. L-823 Connectors
 - (5) Provide O&M Manuals for all equipment.
 - (6) Review troubleshooting practices.

- b. Preventive Maintenance Program Recommendations
 - (1) Equipment:
 - i. L-861T Taxiway Edge Light
 - ii. L-850C Flush-Mount Runway Edge Light
 - iii. L-858 Guidance Sign
 - iv. L-830 Isolation Transformers
 - v. L-823 Connectors
 - (2) Review Failure scenarios and what to do.
 - (3) Provide technical assistance points of contact and phone numbers.

Schedule the training with the Owner at least 10 days in advance and notify the Engineer.

Provide hands-on demonstrations and training of equipment components and functions, including adjusting, operating and maintaining the lighting equipment and systems. Coordinate the training schedule with the Owner in advance, so that the Owner may record the training if desired. Provide 4-hours training for the operational personnel and 4-hours training for the maintenance personnel.

METHOD OF MEASUREMENT

300-4.1 The quantity of lockout/tagout and constant current regulator calibration procedures to be paid for shall consist of all lockout/tagout procedure work and all constant current regulator calibration work completed in place, accepted and ready for operation. This item does not include measurement for constant current regulator equipment.

300-4.2 The quantity of beacon battery backup system to be paid for shall consist of all work to install the new beacon battery back system along with all accessories and appurtenances for a complete and full operational system, accepted and ready for operation.

BASIS OF PAYMENT

300-5.1 Payment will be made at the contract unit price for each complete item, measured as provided above, and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item to the satisfaction of the Engineer.

Payment will be made under:

Item SS-300-5.1 Lockout/Tagout and Constant Current Regulator Calibration Procedures – per Lump Sum

Item SS-300-5.2 *Beacon Battery Backup System – per Lump Sum*

MATERIAL REQUIREMENTS

Fed.Spec.J-C-30 Cable and Wire, Electrical (Power, Fixed Installation)

Fed. Spec. W-C-1094 Conduit and Conduit Fittings; Plastic, Rigid

Fed. Spec. W-P-115 Panel, Power Distribution

Fed. Std. 595 Colors

Underwriters
Laboratories
Standard 6 Rigid Metal Conduit

Underwriters
Laboratories
Standard 514 Fittings for Conduit and Outlet Boxes

Underwriters Laboratories
Laboratories
Standard 651 Schedule 40 and 80 Rigid PVC Conduit (for Direct Burial)

Underwriters
Laboratories
Standard 1242 Intermediate Metal Conduit

CFR 1910 Occupational Safety and Health Regulations

CFR 1926 Safety and Health Regulations for Construction

ANSI/IEEE C2 National Electrical Safety Code

NFPA 70 National Electrical Code (NEC)

NFPA 70E Standard for Electrical Safety in the Workplace

NFPA 101 Life Safety Code

NFPA 780 Standard for the Installation of Lightning Protection Systems

29 CFR 1910 Occupational Safety and Health Standards (OSHA)

29 CFR 1926 Safety and Health Regulations for Construction

Jaquith Industries, Inc. The Design, Installation, and Maintenance of In-Pavement Airport Lighting

FAA ADVISORY CIRCULARS

AC 150/5300-13	Airport Design
AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-3	Specification for L-821 Panels for Control of Airport Lighting
AC 150/5345-5	Specifications for Airport Lighting Circuit Selector Switch
AC 150/5345-7	Specification for L-824 for Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Standard for Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853 Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Base and Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Taxiway and Runway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Isolation Transformers for Airport Lighting Systems
AC 150/5346-49	Specification L-854, Radio Control Equipment
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program
AC 150/5345-56	Specification for L-890 Airport Lighting Control and Monitoring System (ALCMS)

END OF ITEM SS-300

CONSTANT CURRENT REGULATOR CALIBRATION REPORT

Standard Requirements: FAA AC 150/5340-26 (latest edition) Maintenance of Airport Visual Aid Facilities

Owner / Sponsor: _____ Engineer: Garver, LLC
 Airport: _____ Contractor: _____
 Project Title: _____ Garver Project Number: _____
 Vault ID / Location: _____ Date: _____
 Weather / Site Conditions: _____ Last Two Weeks of Rain: _____ inches
 Constant Current Regulator #: _____ Serves: _____

	<u>Completed</u>	<u>Comments</u>
1. Check all control equipment for proper operation.	<input type="checkbox"/>	_____
2. Perform short-circuit test. Record results and recalibrate if necessary.	<input type="checkbox"/>	_____
3. Perform open-circuit test on regulators with open circuit protection. Open circuit protective device should de-energize the regulator. Record results.	<input type="checkbox"/>	_____
4. Check and record regulator input voltage and current. Input Voltage: _____ Input Current: _____	<input type="checkbox"/>	_____
5. Check and record regulator output load. (ONLY if regulator has monitoring package) Volt-Amperes: _____	<input type="checkbox"/>	_____
6. Check and record output current on each brightness step. If output current is outside of the allowable range, adjust the regulator's on-board potentiometer to re-calibrate the output current within the allowable range. Re-record the new output current on this form.	<input type="checkbox"/>	_____

3-Step CCR

5-Step CCR

B10: _____ B30: _____ B100: _____ 1: _____ 2: _____ 3: _____ 4: _____ 5: _____
 Nominal: 4.8A 5.5A 6.6A 2.8A 3.4A 4.1A 5.2A 6.6A

Tested By: _____ (Signature and Date)

Test Equipment: _____ (Manufacturer and Model No.)

Engineer Witness: _____ (Signature and Date)

Owner / Sponsor Witness: _____ (Signature and Date)

INSULATION RESISTANCE TEST REPORT

Owner / Sponsor: _____ Engineer: Garver, LLC

Airport: _____ Contractor: _____

Project Title: _____ Garver Project Number: _____

Vault ID / Location: _____ Date Initial / Final Tests: _____

Weather / Site Conditions (Initial Test): _____ Last Two Weeks of Rain: _____ inches

Weather / Site Conditions (Final Test): _____ Last Two Weeks of Rain: _____ inches

	Circuit Designation and Color Code	Initial Test Results		Final Test Results	
		Regulator Size (kW)	Megger Reading Before Field Work (Megohms)	Regulator Size (kW)	Megger Reading After Field Work (Megohms)
1					
2					
3					
4					
5					
6					
Tested By:					
Test Equipment:					
Engineer Witness:					
Owner/Sponsor Witness:					

Provide signature/date and manufacturer/model no. as required in the fields above.

Initial Test Record – Owner Disposition

Owner / Sponsor: _____ (Signature and Date)

Check one only: Proceed with Installation Hold

GROUND ROD IMPEDANCE TEST REPORT

Owner / Sponsor: _____

Engineer: Garver, LLC _____

Airport: _____

Contractor: _____

Project Title: _____

Garver Project Number: _____

Date: _____

Weather / Site Conditions: _____

Fall-of-Potential Style Tester (F):
Manufacturer: _____

Model #: _____

Clamp-On Style Tester (C):
Manufacturer: _____

Model #: _____

Ground Rod #	Test Equipment Style (F or C)	Impedance Value (Ohms)	Ground Rod #	Test Equipment Style (F or C)	Impedance Value (Ohms)
Tested By:					
Engineer Witness:					

Provide signature/date in the fields above.

ITEM SS-310 AIRPORT LIGHTING SYSTEMS

DESCRIPTION

310-1.1 This item shall consist of furnishing and installing airport runway and taxiway edge lighting systems, retroreflective markers, guidance signs, runway centerline and touchdown zone lighting systems, other taxiway lighting systems, and other approach lighting aid systems, in accordance with this specification, the referenced specifications and drawings, and applicable advisory circulars. The system shall be installed at the locations and in accordance with the dimensions, design and details shown on the plans. This work shall include the furnishing of all equipment, materials, services and incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the Engineer.

310-1.2 Additional details pertaining to the lighting system covered in this item are contained in the advisory circular, AC 150/5340-30, Design and Installation Details for Airport Visual Aids.

310-1.3 The Contractor shall maintain current copies of all referenced and applicable advisory circulars on the job site. The Contractor is responsible to make known to the Engineer any conflict between plans and specifications that he observes or of which he is made aware.

EQUIPMENT AND MATERIALS

310-2.1 GENERAL.

a. Airport lighting equipment and materials shall meet the requirements outlined in Item SS-300.

b. For pre-cast or prefabricated concrete encased light base installations, the Contractor shall submit and coordinate the construction of the proposed pre-cast units with the Engineer onsite to review and approve the construction process. The Contractor shall submit his proposed installation process for review and approval by the Engineer. The Contractor shall provide additional items and work if required and requested by the Engineer for the construction and installation of the pre-cast units at no additional cost to the Owner.

Pre-cast or prefabricated concrete encased light bases may only be assembled at the Contactor's staging area at the airport in order to allow the Engineer to check and approve all such construction items. Pre-cast bases assembled offsite will not be allowed.

c. For in-pavement fixture installations, the Contractor shall submit his proposed installation method and technique for correct placement and alignment of all lights for review and approval prior to any work.

In-pavement lighting systems will require an experienced electrical supervisor and experienced installation team, including licensed surveyor. This includes the complete installation, layout, and coordination with paving joints and paving work.

310-2.2 LIGHT FIXTURES. Airfield lights shall be supplied with all features and accessories including isolation transformers, light bases, base covers, safety ground rods, concrete pads and incidentals required for a complete installation as defined in these Specifications and as shown on the plans.

a. Medium Intensity Taxiway Lights (MITL):

(1) Taxiway edge elevated lights shall be L-861T(L), LED lamp, omnidirectional blue

lens.

- b. High Intensity Runway Lights (HIRL):
 - (1) Runway edge elevated lights shall be L-862, 115 Watt/6.6A lamp, omnidirectional lens or bidirectional lens as shown on Plans and as approved.

310-2.3 LAMPS. Lamps for elevated edge lights shall be 6.6A Quartz and/or LED type as specified.

310-2.4 SPARE EQUIPMENT INCLUDING LAMPS, FIXTURES, AND SPARE SIGN REPLACEMENT COMPONENTS. Provide 10 percent spare lamps of each type installed for lights and signs, minimum quantity of 6 required. Spare lamps shall not be measured for separate payment but shall be considered subsidiary to the light fixture and guidance sign pay items.

Provide 10 percent spare fixtures of each type installed for lights. Provide 10 percent spare sign replacement components of each type installed for signs. Spare fixtures and spare sign replacement components shall not be measured for separate payment but shall be considered subsidiary to the respective light fixture or sign pay items.

- a. A spare elevated LED fixture unit shall be one complete, ready-to-install fixture, including the coupling, column, head housing assembly, cordset, LED power supply assembly, LED assembly, and lens assembly.
- b. A spare elevated quartz fixture unit shall be one complete, ready-to-install fixture, including the coupling, column, head housing assembly, cordset, lamp assembly, and lens assembly.
- c. A spare sign replacement component unit shall include the LED light tube assembly and LED power supply assembly.

The spare lamps, spare fixtures and spare sign replacement components shall be delivered and stored as directed by the Owner, with transmittal receipt signed by Owner's representative. A signed copy shall be forwarded to the Engineer with an additional signed copy placed in the O&M manuals.

310-2.5 GUIDANCE SIGNS. Guidance signs shall be L-858(L), meeting the criteria set forth in AC 150/5345-44, Specification for Taxiway and Runway Signs, and suitable for base mounting. Each unit shall be furnished with the required panels, mounting assemblies, frangible couplings, transformer, intensity control, identification tag, metal tethers, fasteners and safety ground rods.

Style 2 and Style 3 signs shall meet the luminance requirements in AC 150/5345-44 throughout the current ranges of the associated series circuit.

Guidance signs shall have an integral on/off switch for airport maintenance use.

Signs shall be furnished with permanent type nameplates that are both weather and sunlight resistant. Nameplates which are completed with ink markers or similar methods will not be accepted.

Refer to the guidance sign index in the Plans for information on each sign's size, style, class and mode.

The complete sign installation shall be designed to withstand a 200-mph wind load.

Guidance signs shall be Size 2 (15" Legend), Style 2 (3-step circuit) or Style 3 (5-step circuit) as noted in the plans, Class 1 (operation range from -4 degrees F to 131 degrees F), Mode 2 (withstand wind loads of 200 mph).

310-2.6 ISOLATION TRANSFORMERS. New isolation transformers shall be Type L-830 and have a wattage rating suitable for the wattage of the fixture and sign lamps. The transformer shall be listed in FAA Circular AC 150/5345-47.

Provide 10 percent spare isolation transformers of each type installed for lights, signs and other equipment. Spare transformers shall not be measured for separate payment but shall be considered subsidiary to the respective light fixture or sign pay items.

310-2.7 FIELD LIGHTNING ARRESTOR. New series circuit field lightning arrestors shall be installed on the airfield series circuits to reduce the risk of lightning damage to the circuits, including cables, isolation transformers and field/vault lighting equipment. The arrestor assembly shall consist of a NEMA 6P rated metal enclosure, using MOV components, rated for 5,000 volts continuous operating voltage with 25,000 A peak surge current, having a minimum 2 giga-ohm insulation resistance, with L-823 connectors, The arrestors shall be designed specifically for protecting 5 kV airfield series circuits and shall be manufactured by ADB, Astronics or Liberty Airport Systems.

Provide 10 percent spare lightning arrestor units, minimum quantity of 2. Spare arrestors shall not be measured for separate payment but shall be considered subsidiary to the respective arrestor pay items.

CONSTRUCTION METHODS

310-3.1 GENERAL. The installation and testing details for the lighting system shall be as specified in the applicable advisory circulars.

The Contractor is responsible for all surveying and measurement which is required to accurately position and aim airfield lighting systems and equipment.

Airfield lighting systems and equipment that are improperly installed shall be removed and re-installed correctly as directed by the Engineer. No payment will be made for the removal and reinstallation of airfield lighting systems and equipment improperly installed. All remedial work shall be to the satisfaction of the Engineer.

310-3.2 LIGHTING LAYOUT PLANS. The Contractor shall stake the airfield lighting systems, prior to installation of any trench, cable or lighting apparatus. The intent is to stake the installation at the locations indicated, noting any deviation from plan dimensions to the Engineer prior to installation. The Contractor shall obtain the services of an experienced and licensed surveyor to perform this work.

The Engineer shall provide electronic CADD files to the Contractor for this staking work. The Contractor shall stake the items and his surveyor shall provide a CADD file submittal back to the Engineer. Based upon this submittal, the Engineer shall coordinate and provide directions on any adjustments necessary to meet existing field condition requirements and comply with FAA Advisory Circular requirements on the layout and spacing of equipment.

The Contractor and his surveyor shall then make any electronic CADD file spacing adjustments and/or field staking adjustments prior to installation at no additional cost to the Owner.

Refer to General Provisions Section 50 Control of Work for additional construction layout and staking requirements.

310-3.3 PLACING THE EQUIPMENT. The equipment shall be mounted on concrete pads as shown in the plans. Secure the equipment and make all final connections.

310-3.4 MOUNTING, LEVELING, AND AIMING. The concrete support to which the equipment is fastened shall be accurately leveled before mounting the equipment. The units shall be properly aimed, as recommended by the manufacturer of the supplied equipment. This adjustment shall be accomplished using factory-approved aiming devices and techniques.

310-3.5 PLACING LIGHTS. All equipment shall be installed at locations indicated in the plans. Lights shall be laid out by locating the two control points by station as indicated on the plans and measuring the indicated individual separation distances. Light bases shall be located within 1 inch +/- longitudinally and 0.5 inches +/- transversely of the location indicated unless deviation is approved by the Engineer. Excavation for installation of light bases shall be backfilled with at least 4 inches of granular leveling course, as approved by the Engineer. Fixture height shall be as indicated on the Drawings.

For pre-cast or prefabricated concrete encased light base installations, a leveling course of sand shall be placed in the bottom of the excavated hole, sufficient for accurately installing, leveling and placing the lights in accordance with the requirements in this specification and AC 150/5340-30. Concrete encased light bases shall be allowed to cure a minimum of 7 days prior to installation.

Utilize a bubble level device to level all light fixtures in the horizontal light plane during the day, and then check at night to ensure uniformity in light output.

310-3.6 PLACING SIGNS. All signs shall be installed at the approximate location indicated in the plans. The specific requirements for sign location are specified in AC 150/5340-18, Standards for Airport Sign Systems. Specific requirements of this AC are also shown on the Plans. Signs shall be located within 1 inch +/- longitudinally or 0.5 inches +/- transversely of the required location unless deviation is approved by the Engineer. The locations for the signs shall be staked by the Contractor and approved by the Engineer before installation begins.

Provide single module signs with one tether. Provide multiple module signs with a tether at both ends.

310-3.7 PLACING FIELD LIGHTNING ARRESTORS. All field lightning arrestors shall be installed at locations indicated in the plans, typically about every 2,000 feet around the series circuit. The arrestors shall be installed in base cans or handholes as noted on the plans. Provide a minimum #4 AWG copper ground wire to connect the arrestor ground lug to dedicated ground rod outside the base can or handhole on the pavement side of the equipment. This ground rod shall be connected to the counterpoise system using exothermic welds only. Provide a permanent type marker at each arrestor listing the date it was placed in service.

310-3.8 TRANSFORMER INSTALLATION. The transformer for base mounted fixtures shall be placed inside the base. The transformer for stake mounted fixtures shall be located uniformly as shown on the plans. The primary cable connections shall be made with L-823 connectors as described in Item L-108 and have 3 feet of slack cable. The secondary leads connected to the lamp leads by means of a disconnecting plug and receptacle provided with the unit, and this joint shall not be taped. The secondary joint shall be fastened with a holding ring provided for this purpose.

310-3.9 UNIT ASSEMBLY. All electrical equipment, including edge lights, guidance signs and other visual aid units shall be assembled in accordance with the manufacturer's installation procedures. Anti-seize compound shall be used on all screws, nuts, and threads, including frangible coupling threads. If coated bolts are used (ceramic metallic/fluoropolymer coating), then do not apply anti-seize compound.

Provide and install all spacers, shims, and gaskets as required, and verify they are in place before installing the light fixture on the base.

Bolts and washers for new and existing bases shall be new. Do not reuse existing hardware. The minimum thread engagement into top flange of the base shall be 0.5 inches.

~~For in-pavement light fixtures, provide Nord-Lock NL 3/8 stainless steel 2-part locking washers or approved equal, as required by the manufacturer.~~

~~Coordinate recommended torque values with the light fixture manufacturer, light base can manufacturer,~~

~~stainless steel bolts and hardware used, and exact anti-seize compound used, in order to prevent light base thread damage. Utilize a dial type torque wrench for accuracy and to prevent over tightening bolts. Never use impact wrenches/drills when removing or installing bolts.~~

~~The Contractor shall submit complete installation method shop drawings and calculations to determine the proper torque requirements for review and approval by the Engineer prior to any field removal or installation work for in-pavement light fixtures.~~

~~When installing new or existing light fixtures on existing bases, the following work shall be performed for the removal and reinstallation work:~~

- ~~a. Remove all bolts including any that are frozen or broken. If necessary, drill out and tap for new bolt. If the can threads are galled but usable, clean threads with a tap.~~
- ~~b. Remove the light, base plate, transformer, and any foreign object that may be inside the can.~~
- ~~c. Remove the old cable, mandrel the conduits, and shop vacuum out the can clean.~~
- ~~d. Install the new cable, connectors, transformer, gasket, bolts, and other required appurtenances per the fixture type and its location in accordance with FAA Advisory Circular requirements and manufacturer's requirements.~~
- ~~e. Never use impact wrenches/drills when removing or installing bolts.~~

~~The Contractor shall obtain complete installation manuals for the new airfield lighting equipment and the existing equipment to be reinstalled prior to any removal or installation work. Copies of these manuals shall be maintained in 3-ring binders within the Contractor's onsite field office.~~

~~The Contractor shall provide equipment inventory rehabilitation forms to document the fixture and sign rehabilitation efforts required prior to reinstallation. These forms shall be approved by the Engineer.~~

~~Existing in-pavement fixtures shall be rehabilitated with new prisms/lens and gaskets, then pressure tested to ensure they have been reassembled correctly and are ready for installation. In order to ensure this work is correctly performed, the Contractor, Engineer, Owner and equipment manufacturer shall attend a workshop onsite to review the work required in order to replace prisms/lens and gaskets and how to pressure test the equipment properly in accordance with the manufacturer's installation requirements and FAA AC requirements. Demonstration spare units will be provided by the Airport for hands on work review. The work shall only be performed by the Contractor's specific personnel who attend the workshop and are approved by the Engineer and Owner to perform the work. Tests reports shall be kept by the Contractor to record the work performed, including signature and date of those employees performing the work. The Contractor may only perform this work in a conditioned space environment.~~

~~In-pavement light fixtures that are installed too high will require their complete removal and reinstallation at no additional cost to the Owner. In-pavement fixtures shall be provided with all spacers, shims, gaskets and other appurtenances for complete installations that comply with FAA Advisory Circular requirements and manufacturer's installation instructions. All assemblies and work shall be to the satisfaction of the Engineer.~~

~~**310-3.10 IDENTIFICATION NUMBERS.** An identifying number shall be assigned to each light and sign in accordance with the plans or as approved by the Engineer and Owner. This number shall be imprinted with reflective black with 1/2" letters on a non-corrosive metal disc 2" minimum diameter and attached to the pavement side of the fixture with a metal screw.~~

~~**310-3.11 TEMPORARY AIRFIELD LIGHTING.** Refer to the Airfield Lighting Phasing Plans and Details for additional requirements. Existing lighting circuits shall remain operational by use of temporary circuits. New lighting circuits shall also be connected and remain operational by use of temporary circuits. This item shall include all work to maintain the existing and new lighting circuits during construction and allow all taxiways~~

and runways in operation to remain lighted, including that portion through the construction area, as indicated in the Phasing Plans and as directed by the Engineer.

The Contractor shall perform initial field work including location and verification of existing circuits and submit plans for the temporary airfield lighting required in each work phase, for review and approval by the Engineer and Owner, prior to starting work of that phase. This work shall include megger testing of circuits and circuit segments before and after installation and connection of jumpers.

The Contractor shall install couplings and other required fittings/appurtenances in conduit systems at last pavement joint within each phase for connecting to conduit systems in the next phase, or for connecting to existing conduit systems to remain.

310-3.12 TESTING. The installation shall be tested in operation as a completed unit prior to acceptance. Tests shall include taking megger and voltage readings as outlined in Item SS-300 and Item L-108. Testing equipment shall be furnished by the Contractor. Refer to Item L-108 for additional test requirements.

Tests shall be conducted in the presence of the Engineer and shall be to his/her satisfaction.

All installations shall be fully tested by continuous operation for not less than 24 hours as completed systems prior to acceptance. These tests shall include the functioning of each control not less than 10 times.

Equipment and materials covered by FAA Advisory Circulars are referred to by item numbers and approved equipment is listed within the AC 150/5345-53 Airport Lighting Equipment Certification Program's monthly Addendum, which contains a complete and updated listing of the certified equipment and manufacturers, and is listed in the FAA Buy American Preference equipment list, which is also updated monthly. The Contractor shall provide and install new certified equipment that works reliably and efficiently with the existing equipment to remain in service. The Contractor shall provide any additional accessories and/or appurtenances required to provide fully functional electrical systems to the satisfaction of the Owner and Engineer, at no additional cost to the Owner.

The Contractor shall ascertain that all lighting system components furnished (including FAA certified and approved equipment) are compatible in all respects with each other and the remainder of the new and existing systems. Any non-compatible components furnished by the Contractor shall be replaced at no additional cost to the Owner with a similar unit that is approved by the Engineer and compatible with the remainder of the airport lighting system.

METHOD OF MEASUREMENT

310-4.1 The quantity of lights of each type to be measured for under this item shall be the number of each installed, complete with isolation transformers, lamps, junction cans, base plates, gaskets, couplings, specified height columns, concrete bases, cables, connectors, safety ground rods, bolts/hardware, and all other required appurtenances, as completed units in place, ready for operation, and accepted by the Engineer. See section on Spare Equipment for information on spare fixture requirements.

310-4.2 The quantity of guidance signs of each type to be measured for under this item shall be the number of each installed, complete with isolation transformers, lamps, junction cans, concrete bases/pads, cables, connectors, safety ground rods, tethers, and all other required appurtenances, as completed units in place, ready for operation, and accepted by the Engineer. See section on Spare Equipment for information on spare sign component requirements.

310-4.3 The quantity of field lightning arrestors, complete with arrestor, base, connectors, equipment safety ground rod, lightning arrestor ground rod, conductors, and all other required appurtenances, to be measured under this item shall be the number of each type installed, as completed units in place, ready for operation, and accepted by the Engineer.

310-4.4 Temporary airfield lighting shall be measured as a lump sum complete item [per each respective phase work area], including all work completed in place and ready for operation, and including the installation, protection, and removal of all temporary cables, conduits, lighting, grounding, marking, and associated items and appurtenances, as indicated in the Drawings and as directed by the Engineer.

BASIS OF PAYMENT

310-5.1 Payment will be made at the contract unit price for each complete item, measured as provided above, and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item to the satisfaction of the Engineer.

Payment will be made under:

- | | |
|-----------------|--|
| Item SS-310-5.1 | L-858(L) Base Mounted, 3-Module Guidance Sign, Installed -- per Each |
| Item SS-310-5.2 | L-862 Base Mounted Runway Edge Light, Installed -- per Each |
| Item SS-310-5.3 | L-861T(L) Base Mounted Taxiway Edge Light, Installed -- per Each |
| Item SS-310-5.4 | L-861T(L) Base Mounted Taxiway Edge Light, Installed on Existing Base – per Each |
| Item SS-310-5.5 | Field Lightning Arrestor, Installed – per Each |
| Item SS-310-5.6 | Temporary Airfield Lighting -- per Lump Sum |

END OF ITEM SS-310



12141 Wickchester Lane
Suite 640
Houston, TX 77079
TEL 713.491.8333
FAX 713.395.5486
www.GarverUSA.com

MEMORANDUM

To: Potential Bidders **Date:** August 15, 2016
From: Thomas D Dodson, PE ^{TD}
RE: Jack Brooks Regional Airport – Taxiway D Reconstruction (2016)
Bidder Questions

See below for responses to Bidder questions regarding the Taxiway 'D' Reconstruction project at the Jack Brooks Regional Airport.

Question 1: There is a note in the spec (page SS-310-5) to rehab existing in-pavement fixtures with new prism/lens and gaskets. Is there a bid item for the work?

Answer 1: No. The project contains no work related to in-pavement light fixtures. The portion of SS-310 containing these requirements has been struck-through and the revised SS-310 is attached to Addendum #2.

Question 2: If contractor's staff have airport security badges from other airports, will that be acceptable for badging on this project?

Answer 2: Contractor's staff are encouraged to display their security badges to help identify themselves to airport operations and security officers. Contractor is to provide documentation of staff credentialing as part of the notification of intended airside staff during the project. However, badging at another airport does not provide access of the contractor's staff to areas outside the project without advance notice to airport operations and does not waive requirements airport operations has for escorts, radio operators, etc.

Question 3: How is the work on Taxiway 'F' intended to be carried out?

Answer 3: Due to the limited access users of the East Ramp have to the airport, the intersection of Taxiways F and D cannot be closed; therefore the work is to be carried out in a fall-back basis. As noted in the pre-bid meeting, this intersection can be busy during daytime and weekends. If the contractor prefers, the project improvements in this area can be carried out during overnight hours, when the opportunity for longer work periods without the need for fall-back may be possible.

Question 4: How is Mobilization under FAA Section 105 versus Site Preparation under item SS-120 to be divided and paid?

Answer 4: Refer to each item for a description of the work that is to be included in the item. The intent was not to directly overlap work items between the two specifications. Please refer to the work outlined in each item for the development of your costs to include in the bid price for each item.

Question 5: Can the contract time be changed to 270 calendar days?

Answer 5: No. Operations and safety at the airport are of the utmost importance and compressing construction time to a reasonable but expedited schedule minimizes impacts to the airport. The design process included development of a detailed construction schedule that included typical weather days to arrive at the contract time. There will be no change to the contract time for this project.

Question 6: The phasing plan does not show the lighted runway closure markers. Will these be required when the runway is closed?

Answer 6: Yes – when the runway is closed during hours the ATCT is not staffed, Runway Closure Markers will be required. Please see the updated item SS-120 and bid form, along with the update plansheets that include runway closure markers as part of the Phase 1A work.

Question 7: Bid Item P101-2, Milling/Removal of Asphalt Paving, only has a quantity of 2,110 square yards. This quantity would only cover the milling at the asphalt transitions along Runway 12-30. Do you plan to adjust the quantity for the other asphalt pavement?

Answer 7: No. The two connections to Runway 12-30 consist of asphalt transitions. These areas are to be milled in Phase 1A to allow for soil backfill to remove the connectors from the runway without removing the concrete pavement beneath. Milling of these areas are the only milling required on the project. Pavements outlined for removal that include asphalt surfaces may be milled at the contractor's option, but will not be paid for as milling. Any milling of pavements to be removed will be considered subsidiary to the pavement removal as called for in the plans and outlined in Item P-101-1, Concrete Pavement Removal; as the pavement primarily consists of concrete.